

THE PSYCHOLOGICAL REVIEW

NEURO-PSYCHIC TECHNIQUE

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One of the best illustrations of the growing dominance of environmental factors in evolution and in ontogeny is to be found in the development of an acquired technique to take the place of inherited technique in the neural and psychic control of animal behavior. This transition from the dominance of inherited to acquired neuro-psychic technique is of course most apparent in the case of man, where the latter type of control is overwhelmingly important; but it is also to be observed in the lower forms, especially in those nearest to man. This development of the environmental dominance in neuro-psychic technique can be traced through two aspects. First, in the control of action, from tropism or instinct to habit, through six stages or processes of development; second, in the conscious evaluation of conduct, from primitive sensory and effective elements to intellectual discrimination and measurement, also through six stages or processes of development. Although the stages of these two types of development are not minutely correlated and parallel, they do possess a measure of correlation and may be arranged in parallel columns as follows:

The Control of Action
Chemotropism
Instinct

Overt Habit

Internal Habit

Language

External Habit Storage

Conscious Evaluation of Conduct

Primitive Sensory Orientation

Affective or Feeling Orientation and Valuation

Primitive Emotional Orientation and Valuation

Perceptual Orientation and Valuation

Conceptual Orientation and Valuation

External or Statistical (Mathematical) Measurement and Valuation

Each of these types of development begins in inherited biochemical and bio-physical adjustment technique and ends in primarily acquired symbolical or intellectual processes which have been objectified to the extent that they exist primarily outside of the organism and are conscious and subjective only potentially; that is, they are stored externally in symbolic content and are brought into consciousness only upon occasion when they are being employed in some process of individual or social transformation. In this way the subjective and instinctive becomes, as a result of a process of evolution, the objective and acquired. And the forms of the acquired and externalized technique, consisting of institutions and other forms of the psycho-social environment, come to dominate character growth in the individual and the future evolution of the social type. In truth the environment has always dominated the selection of traits and types, but with the transformations here noted the dominating environment becomes primarily psycho-social instead of predominantly physical and biological.¹

I THE CONTROL OF ACTION

The animal organism is protoplasm. So far as science is as yet able to shed light upon the question, action reduces ultimately to or is based upon chemical change. If the *élan vital* or the life principle is more than a metaphysical hypothesis, once useful in contrast with the earlier spiritistic explanation of life, but now no longer helpful in an age of science and scientific method, no authentic investigation has been able to reveal the supporting facts. Action in the beginning then is chemotropic and the reaction of simple and relatively undifferentiated tissue is to chemical or physical stimuli. Remnants of this sort of movement we still find in abundance in the lower forms of life. In the higher forms, such as man, we know that certain tissue and organic responses can still be mediated without the use of a nervous system.²

¹ See 'The Influence of the Environment as a Social Factor,' *Publications Amer. Sociol. Soc.*, 1921: 16, 107-112.

² Paton, Stewart, 'Human Behavior,' 39-45.

But the advantages of a nervous system are so marked¹ that evolving types of organisms specialize protoplasm, apparently from the integument which is highly tropic because of its chemical contact specialization, into a nervous system. The advantages of speed and completely synchronous reactions are so marked that the animal types with specialized nervous tissue win out in the struggle for existence. At first the nervous systems are simple and their structural action patterns are relatively fixed. That is, in the early stages of neural development animals had reflexes or instincts, although these were then, as now, capable of a certain degree of modification under the influence of environmental pressures.² Instinct or reflex dominated the activities or movements in animals during that period of animal evolution which lay between the dominantly chemotropic and the dominantly habit-controlled forms. Especially among the land forms known as insects and other arthropoda and annulata and the water forms of similar development classed generally as molluscs, and many other lower branches of the animal kingdom, extending on up through the early vertebrates, such as the fishes and reptiles and birds and even into the mammals—some would say even up to man or including man—the animal kingdom was under the influence of inborn or inherited automatic action patterns or action structures, called instincts and reflexes, just as the lowest forms of animal life are bio-chemically dominated and as the plants are bio-chemically and bio-physically controlled in simpler and more primitive ways. And just as the bio-physical and the bio-chemical tropistic controls still persist, even in the highest forms of life, so are the more advanced neurally formed action patterns, the reflexes and the instincts, still powerful in the direction and control even of human activities.

What may properly be called the neuro-psyhic life of animals began with these neural action patterns which were determined in the heredity of the organism. At first there was no brain. The organism was the sport of the physical

¹ Meyer, M. F., 'The Psychology of the Other One,' ch. 2.

² Jennings, H. S., 'The Behavior of Lower Organisms.'

environment in which it lived. Its inherited action patterns—reflexes and instincts—were merely more helpful and efficient mechanisms by means of which the organism could make a more rapid and complete, and a slightly selective, adjustment to the environment which it could not escape. Such are also the nature and function of our highly complex nervous systems at this end of the evolutionary process. We cannot escape environment, but with the help of our complex neural mechanisms we are able to react much more selectively, and we have also added memory and rational choice or selection in adjustment which greatly extend the selective particularization of our adaptive adjustments. In man this highly selective or differential character of the adjustment activities has given rise to the belief in—some say illusion of—free will. That is, man is an animal with a personality. His adjustments to environment are made not alone on the basis of a response to the immediate environment, but all his accumulated action patterns or nervous sets, derived from the past through inheritance and through habit acquisitions, influence—usually dominate—his responses. Action by impact or immediate chemotropism is relatively unimportant in the life of man.¹ Man is still the creature of environment, but it is not necessarily his contemporary environment, and much less the environment which immediately impinges upon him. Environment selected his instincts,² and environment and his instincts and previously formed habits select his habits. And with the coming of a psycho-social environment, to supplement the physical and biological environments, habit formation is primarily under the direction of this new environment.

But this is somewhat in advance of the argument. Habit is the third form of organic activity control—and the second neuro-psychic technique—employed in mediating a more effective and selective adjustment of the organism to its environment. It appears when tropism and instinct can no longer secure sufficiently accurate, rapid and differentiated adjustment of the organism to a radically and rapidly changing

¹ Bernard, L. L., 'The Objective Viewpoint in Sociology,' *Amer. Jour. of Sociol.* 25, 313 ff.

² Bernard, L. L., 'The Influence of Environment as a Social Factor,' *op. cit.*, 89 ff.

environment without changing the form and structure of the organism. Those animals which live in a relatively constant medium, especially the sea animals, or the insects which so generally have but a limited habitat and live but a season or through only a part of it, have little need of habit forming powers. Insects which live longer than one season and thus may be said to have a varied climatic environment, or those which change from the air to the earth or vice versa, usually change their form as a method of instinctive adjustment to a changing environment. Where there is no adequate instinctive equipment for uniformation or modifying adaptive adjustments, habit modifications must arise. At what stage of development they first appear it is scarcely possible to say. Jennings finds them operating very low down among living forms,¹ but here they are seen doubtless as relatively simple recombinations of tropic responses and reflex patterns. In fact, the earliest acquired or habit modifications of responses are of just this nature, relatively formal and simple recombinations of elemental inherited response patterns.

The earliest habits are overt in character. That is, they involve an external readjustment of the organism. An inner, or neural, adjustment is of course also involved. But ordinarily the adaptive readjustment which we call habit neither originates nor ends in the neural processes. Its inception comes from environmental impacts upon the end organs of the nervous system and the body tissues, and the neural stimulus-response patterns act primarily or exclusively as transmitters, not as transformers, of the impulse. The organization of the environment determines in the main the organization of the response, aided by whatever changes of neural structure have been left as the result of previous modifications of the stimulus-response processes. The response occurs overtly as a whole, instead of being lost or compressed in the neural complexes within. As yet there can scarcely be said to be neural complexes, at least of any great variability or manifoldness of organization. Associative memories are apparently purely or almost wholly physiological rather than conscious. Conse-

¹ *Op. cit.*, 238-259, ch. 18 etc.

quently, their action in reshaping response is direct rather than indirect. The habit-making animal consequently responds overtly or muscularly and glandularly as a whole, for there is little or no inhibition of neural response processes by what we call mental, much less intellectual processes. The animal acts; it does not think. Its action differs from instinctive action only in that its responses and action patterns are modified to meet the demands of a changing complex environment. Animals which cannot make these modified or habitual responses to changing environments must perish or seek refuge in some parasitical or recessive mode of existence.¹ The animals that make the most highly selective adjustments to their environment are those that think. While they form overt or total response habits, their acquired adjustment technique is primarily internal and is laid down in the form of neural complexes or sets. They build up a vast aggregate of neuro-psychic technique which functions selectively in the adaptive process. Action patterns which have been worked out in previous adaptive processes remain potential as memory patterns which go into action upon occasion. This memory content, with its predisposition to repeat action of previously experienced types, is the central element in personality.² It is the core of the self-consciousness and the social consciousness. It serves as the basis upon which new activity patterns are built or the center to which future adaptations are assimilated. It is this memory core, therefore, the modified personality content, which selects and dominates the adaptive adjustments of the human organism and gives rise to the choice which we have hitherto called free will. Past environmental determination of neuro-psychic habit complexes has become so cumulatively vast that its power of selection of response is often greater than the power

¹ Chetverikov maintains that the insects were able, because of an outer chitinous skeleton, to develop in an opposite direction from the vertebrates and "by continuously diminishing the dimension of their body, to conquer for themselves an entirely independent place among the other terrestrial animals, and not only to conquer it but to increase in an endless variation of forms and thereby acquire a tremendous importance in the economy of nature. Thus their insignificance became their power." *An. Rept. Smithsonian Institution* 1918, p. 449.

² Herrick, C. J., 'Introduction to Neurology,' 2d ed., 328, 346, etc.

of the immediate environment itself. This is the reverse of the situation where overt habit formation is dominant. In this overt type of adjustment the external environment molds and dominates the response, which is, however, modified in a secondary degree by the internal or neural organization, both instinctive and acquired.

In internal habit organization and control the previously formed neural sets inhibit or modify the impulses which are released by environmental stimuli. Or, in a second type of cases, to state the obverse, an interfering environment interrupts an habitual or an instinctive activity process and throws the overt expression back upon the inner neural organization built up around the conscious and unconscious associative memory or cumulative internal habit. This internal acquired neural organization receives the suspended activity processes thrown back upon it because of external interference and redistributes the thwarted impulses according to the patterns which have already been formed. This results in their further modification and reorganization on an internal habit basis.

In both cases—and the two are often operative in conjunction with each other—internal neural activity or neuro-psychic technique is substituted for the overt or external adjustment. Apparently the reason for this is that impulses, to action crowd upon each other under the pressures of a modern complex environment, or the past impulses recorded in the neural habit dispositions (and in a secondary degree in the instincts) have become so numerous that it is no longer possible for all the stimuli or internally released impulses to go over into overt action. There is not time for all of the overt responses to take place. Neither is there energy in sufficient quantities in the organism to carry through all these stimulus-response processes into overt action, even if there were time and otherwise opportunity. We learn to think in part in order that we may not destroy ourselves by overexertion and too intense and precipitate activity. The net result of such inhibition of overt activity expression by the internal neural organization is that trial and error or trial and success in adaptation is transferred from overt expression to internal or

symbolic or conscious substitute expression, and the multitude of errors in conduct to which premature overt activity would commit us are in the main avoided by means of first working out the adjustment internally in substitute neuro-psychic technique, which in its highest form is conscious and rational thought. Once committed to a completed overt activity adjustment, which is less effectively adaptive than it is possible to secure through more refined inner adjustment methods, revision of activity in the direction of greater economy and effectiveness is much more difficult than if the overt adjustment had not occurred in the first place. Overt adaptations are much more tenacious and less easily detached than the internal ones. They cling by the force of objective completeness, a fixity which is not easily dissolved because the adjustments are external and therefore to be modified only indirectly through the inner or neural organization of habit controls, conscious or unconscious in character. Thus there is a very great advantage to the organism, from the standpoints of flexibility, rapidity and accuracy of adjustment, as well as of economy of time and energy, from transferring adaptive habit technique largely from the overt to the inner sphere. It becomes neuro-psychic, even mental adjustment technique, instead of neuro-muscular and neuro-glandular adaptation. But it remains habitual in character; is even more habitual or acquired than in the preceding stage of overt adjustment on an acquired basis.

Thinking is essentially habitual or acquired in character, although it may have an underlying groundwork of instinctive action patterns. But reflex or instinctive activity is not conscious,¹ McDougall and others to the contrary.² All forms of mental experience appear with the interruption or modification of instinctive or acquired action patterns, leading to a readaptation of the organism under the pressures of environment, and thinking is merely the highest expression of the mental or conscious life. In thinking, which is the correlate of the internal substitute neural organization, sub-

¹ Herrick, C. J., *op. cit.*, 336.

² 'Introduction to Social Psychology,' 8th ed., 29.

jective or individual habit adaptation reaches its greatest flexibility. It is thus that internal habit adjustment develops its great power of selection of adaptive responses. The organism does not respond overtly to the external stimulus until first a satisfactory organization and reorganization have taken place within. Neurologically speaking, all important interferences of neuro-psychic impulses or action patterns have been resolved into single unitary tendencies to response which are now free to go over into overt activity adjustment responses. We say that we think out our plan of action before we proceed. That is, we are conscious, at least in part, of the inner impulses and tendencies to action which are inhibited and of the synthetic or dominating one which finally is released from the internal inhibitions for overt expression or action. We may even say that we will it, by which we mean, in the language of neuro-psychic technique, that we are conscious of the dominant urge or impulse of the action pattern, viewed in the light of the response, which is freed from inhibitions and goes into action. Habit has become so flexible and so rational in the conscious aspect of its organization that it selects an adaptive adjustment which we call intelligent, to the insistent and overwhelming environment.

The highest form of actual habit is the internal or neuro-psychic type, which is the most flexible in organization and which therefore offers the largest possibilities of selective and intelligent adaptive adjustment of the organism to its ever present and insistent multifold environment. This inner neuro-psychic habit organization objectifies itself largely as speech or language and finally and secondarily as overt action. While the ultimate end of all thinking may be said to be action of a character appropriate to achieve the ends disclosed by the thinking process, a more immediate and preparatory—in many cases, a substitute—end or objective is communication of these ideas. The internal organization of acquired or habit processes cannot go on indefinitely in any mind without exercising the discharge as well as the receiving processes of his neuro-psychic mechanism. People cannot think without stimuli, nor can they think indefinitely without response.

But they can think longer without response than without stimuli.

Speech is largely in the nature of a substitute for overt muscular expression or body motion. The mind perceives the results of speech as it perceives the results of bodily movement, and this perception reacts upon the neuro-psychic organization and helps to control and formulate a new phase of the inner adjustment of the organism to its environment. Speech is substituted for body movement, as a form of overt response, because it is more rapid, more intimately adaptive and more discriminative. It saves time and energy and secures a more perfect set of the organism for the completion of the muscular adjustment when it becomes necessary. It is in the nature of a preliminary or preparatory adjustment process, corresponding to the internal neural and thought aspect. Just as the internal or neuro-psychic organization is the indispensable first phase of any overt act in an organism of a higher type, so may the second or overt phase be either body movement or speech. In the highest or human type, it is more frequently speech than body expression, for the reasons of economy and effectiveness already mentioned. But in the less cultivated human types and personalities, and in the lower animals generally, the overt response is usually of the larger muscles rather than of the vocal processes which serve the function of communication and therefore of preliminary adjustment of the organism to its environment.

In the highest types of cultivation, most markedly in the professional thinker, the preparatory and preliminary character of speech in the adjustment process may be so unapparent that it is not observed. Thus the philosopher may appear to think and speak or write merely for the purpose of thinking, writing, or speaking. Such would seem to be a case of 'art for art's sake'; but this is an illusion due to the fact that the preliminaries have developed to such huge proportions comparatively that the ultimate purpose in adjustment is lost sight of. In some cases this situation becomes pathological; and especially is this true where the litterateur, the artist, the logician, or the metaphysician piles up his technique or expresses

himself merely for his own æsthetic satisfaction without expectation of or desire for effective overt adjustment. His interests and activities become inverted and stand as a subjective substitute for external or objective adjustment. Historically the scholastics and the ascetics have illustrated this tendency, as in some degree did the inverted philosophy of the Stoics and of the Christians of the age of Augustine. Hamlet is supposed to have suffered from this difficulty. And modern legislatures, with their investigating committees intended only to investigate, approach dangerously near to this classification. But ordinarily and under proper limitations and guidance, thought and the communication of that thought are valuable preliminaries to effective and rapid overt adjustment of the organism as a whole to its environment, paradoxical as it may seem.

Written language performs the same general functions as spoken language, but even more effectively. The overt expression involved in written language is more nearly akin to gesture than to vocalization. The muscles of the hands and arm, and, in a much slighter degree, of the whole body, especially of the neck and eyes, are called into service to the exclusion of those of vocalization; although these last may have a rudimentary innervation by virtue of a coördinated, but inhibited, response to the same neuro-psychic centers. Also a new apparatus of communication must be created with the advent of written language. The old symbols of vocal communication no longer serve and new symbols which must be interpreted by the eye come into use. Thus the eye comes to be employed for a new purpose, that of interpreting abstract meaning values, a function which formerly belonged especially to the ear; and corresponding changes in neuro-psychic organization and association must be set up. In our age there is probably some tendency toward a shift from audiles toward visualizers in making imaginal associations. The symbolism of written language, moreover, is wholly acquired, except in respect to the most elementary bases of perception processes, such as the ability to distinguish light and shade and some degrees of color, and these have only a

very distant and indirect relationship to the meaning content of the symbols. The symbols of vocal language are also primarily acquired; but they contain more of the instinctive in that certain emotional calls and tonal values, as well as cries and ejaculatory expressions, are possibly rendered more easily perceptible because of inherited adaptations. But all the intellectual content of language of any kind is very recent in origin and is wholly acquired in the form in which we find it.

Written language is capable of performing many preliminary or preparatory adjustment services which spoken language cannot perform. Spoken language greatly increases the possibility of the coöperative or coadaptive adjustment of men to their environment, by enabling them to communicate their aims and formulate common objectives and agree upon a common procedure or technique. It also makes possible the assembling of technique which is of so much value in the adjustment process. The transmission of culture and technique by word of mouth is the second most sacred and honored process among primitive men. The most respected is the establishment and control of relationships between man and the supernatural. But spoken language works only at short range. It must be relayed through other organisms, other minds or brains, if it is to travel great distances or to descend beyond a single generation. Hence, the great relative advantage of written language, in all but the most limited range of contacts. At great distances, only the written or printed word can carry the message intact and uncorrupted by the neuro-psychic media through which the spoken word must pass. On the traditional side, written language is superior to the spoken, both because of the greater volume which it is able to transmit and because of the greater accuracy with which the content is conveyed.

And this brings us to the sixth and final phase of activity control organization, that which is outside of the individual organism and rather a part of the social organization. With the advent of written language neuro-psychic technique began to be organized and stored outside of the individual's action patterns and consciousness. This process of external storage

of neuro-psyhic technique has increased to such an extent that now by far the greater portion of it lies outside of the neuro-psyhic and neuro-muscular organization of any one individual. Strictly speaking, of course, the printed page is not neuro-psyhic or inner habit technique. It is only potentially such. But it has been inner habit technique, and it may be again. Its future utilization as such is the ostensible reason why it was written or printed. It is externally stored inner habit or ideas or neuro-psyhic technique; and ultimately, in the normal course of events, it should become in some form or other overt or neuro-muscular technique.

It is only by means of this external storage of potential habit or neuro-psyhic technique that we have been able to achieve civilization. Non-writing peoples have not been able to advance beyond the status of barbarism. Their wise men could not carry in their brains—conscious associative memories—a sufficient volume of ideas representing external technic processes to enable them to advance greatly in the arts and in the rational interpretation of nature and society. The early wise man or seer spent the whole of his lifetime acquiring knowledge only to find himself on the brink of the grave. This internal storage of ideas, because of the brevity of life, rendered knowledge extremely perishable. But with the coming of parchments and books, which could be reproduced and multiplied mechanically instead of biologically and psychologically, the transmission of knowledge became much less a burden and the time of the sage or seer was set free for the accumulation of further wisdom. Also, the accuracy of the transmission was improved with the adoption of mechanical means. There was no longer the difficulty of distortion or reinterpretation according to prejudice or preconception in the passage of vocal words from mind to mind and from mouth to mouth. Indispensable as is the human mind at certain stages of the process of the group or collective handling of ideas, it is an extremely unreliable and inaccurate agency when not adequately standardized by outside means.

But the greatest gain of all, perhaps, which has arisen from the external storage of ideas, made possible by written lan-

guage is that it has rendered feasible the transmission in large volume of highly abstract ideas embodied in unusual and wholly artificial or acquired symbols. This transmission would not have been possible on any large scale without written language, because such abstract ideas and symbols would have had to pass through minds which could not have comprehended them. Consequently they would have been lost to all except a specialized and favored few who could make—in fact, did make—a monopoly of them. With mechanical methods of transmission the content, however abstract and difficult to comprehend, is independent of transmitting minds, for it is dependent upon neuro-psychic technique only at the two end processes—at its inception or source and at its objective, where the material is read and absorbed, that is, where a new inner habit content is being organized.

The aggregate advantage of external storage of potential or compressed habit or neuro-psychic technique is tremendous. It enables us to build up a body of technic processes almost without limit. No discovery, no knowledge which can be of use to man need be lost. There is no impossible burden of keeping the whole of the content in mind. It is safely stored and may await utilization for a hundred years, or any length of time, and at the end of the period be as available and as intact as at the beginning. The only limitation that may be placed to the accumulation of this sixth type of neuro-psychic technique is that which is set by the limits of storage—which are as yet remote—and those set by the limitations upon the human mind and its power to master the keys which will unlock the storage houses of this potential technique. We no longer attempt to teach any one person any considerable portion of this externally stored knowledge, nor even all people collectively all of it. Long ago we began to content ourselves with teaching the key sciences or disciplines which would unlock the treasure-houses, and now we teach any one person only one or two of these, with any degree of profundity, although it is still our ideal to give everybody some knowledge of each of the basic sciences and arts which serve as keys to the greater whole which lies in storage. The most immediate con-

sequence of this limitation upon the field of knowledge which any one can cover is that we are forced to make collective use of the expert. In the future, society must be ruled by or through the expert, and for the correlation of the work of the experts we must devise some social mechanism; for no one man can carry in his actual—as contrasted with his potential—neuro-psyhic habit technique all of the knowledge which is necessary to perform this function. Nor can all men together do it, except by the aid of some social mechanism or device.

The evolution of the activity controls has now been traced briefly and it must be apparent that there has been an increase in the flexibility of the action patterns from the period of the dominance of instinct to the period of the dominance of externally stored potential habit complexes. Along with this increasing flexibility of action patterns has also gone a greater degree of selectiveness in the adjustment process, so that the adaptation of the organism becomes increasingly more highly specialized and individualized. Thus there has grown up in the human type so great a degree of selective adaptation that man is said to have a free will by means of which he exercises choice and controls his environment instead of permitting it to control him. We need not quarrel on this point. Perhaps the truth is to be found in the view that there is no essential difference between the concepts of the control of environment by man and a more efficiently specialized adaptation of man to his environment, by means of which man comes to utilize natural forces and laws in perfecting his adaptation.

With the coming of the final stage of neuro-psyhic development, that in which there is external storage of potential habit on a very large scale, the environment and the neuro-psyhic content tend to merge. In this stage man's most significant adjustment technique is the inner or neuro-psyhic. Also, his most effective environment has come to be the psycho-social, which has gradually been created as the result of the accumulated adjustment technique arising out of man's compulsory adaptation to physical nature. That is, he no longer adapts directly to the physical world, at least in any

preponderating degree, but he adapts to it indirectly through his psycho-social environment, which he has built up as a buffer or protector between himself and the remorseless physical world with which in his early history he came so rudely and harshly in contact. It is not freedom from environment that man has achieved, but relative freedom from direct contact with his physical environment, which he has attained by becoming more subject to a newly evolved psycho-social environment. This newer environment creates him and molds him, even thrusts itself into his inner consciousness and his subconsciousness, and it creates of him a personality, whereas before he was not one.

But with the invention of books this psycho-social environment, which men created and which now creates civilized men, is coming more and more to merge itself in the printed books themselves. Today our institutions and opinions, customs and conventions, are writing themselves into books and the press generally. Originally our institutions and conventions—the psycho-social environment—grew out of the spoken language and actions of men, as the objectification of the inner habit organization or neuro-psychic technique. This was the source of the psycho-social environment until the coming of writing and printing, and it still is to a large extent. But as surely as written language comes to exceed in importance spoken language, as printed books supersede talk and tradition, just as surely must the psycho-social environment come to be dominated by this more stable and voluminous and abstract content. The psycho-social environment is no longer so simple and concrete and transparent; it constantly becomes more abstract and general. It organizes itself into principle and law and system. In this way it comes to reside increasingly in the written language.

Here also, we found, is now the chief seat of the neuro-psychic technique which directs action from the individual. More and more the human mind projects itself into written records and manuals, encyclopedias and treatises, libraries. Upon these it depends for all but the most immediate direction of conduct, turning to them for instruction and guidance.

With the keys which every well-trained mind holds, it unlocks these storehouses of knowledge and makes potential habit actual and operating neuro-psychic technique, which assumes the control and direction of the overt body activity and thus consummates the particular adjustment of the organism to environment which is in hand. The advantage of utilizing such external resources of stored habit for adaptive purposes has already been dwelt upon. It affords a degree of differentiation and selectiveness in adjustment which cannot be attained under the dominance of any of the preceding stages of development of neuro-psychic technique. But the most significant fact, from an environmental interpretation standpoint, is that the newer psycho-social environment and the newer and dominating neuro-psychic control content become one and the same. This identity of the two categories obtained in some degree even when the psycho-social environment was constructed out of the content of spoken language. But in that stage of development of neuro-psychic technique the dominant content was not outside of the inner neural organization and in the customs and traditions; it was still possible to hold practically the whole of the neuro-psychic technique content within the head without storing it and drawing upon it from the outside for use. Consequently, the merger of the two categories, in their dominant aspects, is as recent as the dominance of written and printed materials.

II CONSCIOUS EVALUATION OF CONDUCT

Turning now from the evolution of activity controls to the evolution of a technique of evaluating conduct with reference to its adjustment services, we find something corresponding to sensory orientation in the very lowest animal forms. Protoplasm itself is sensitive to light, heat, and other physical and chemical contacts. Before animals can see or smell or taste, in the ways in which the higher organisms perform these functions through their specialized senses, they are able to orient themselves in analogous ways through the more general sensitivity of their tissues.¹ But these processes were

¹ Jennings, H. S., *op. cit.*, 250-9, ch. 16, etc.; Herrick, *op. cit.*, 25; Paton, *op. cit.*, 33-4.

probably not conscious, certainly they did not have elements of self-consciousness in them, as have our human perceptions, when we say we see or taste or feel certain objects. They do not even operate or transmit their impulses through a nervous system in the lowest animals, but the sensitive tissues themselves carry the impulses to action. As suggested above, this sensitivity is apparently primarily chemical.

But somewhere higher up in the scale of animal development sensory consciousness does appear, doubtless at first vaguely and poorly coördinated and not perceptual in character, because the great conscious coördinating organ, the cerebral cortex, has not yet appeared or is so poorly developed that mental life of a well-defined character is not possible. Sometime also, possibly earlier, possibly later, conceivably contemporaneously, another psychic element, feeling, makes its appearance. Feelings and sensations are the original psychic elements, so far as we know them now. Which was prior to the other is not determined. Both are primitive and they are apparently wholly distinct in character. Logically, the sensation, at least as a neural process, is prior to feeling, because the latter can arise only out of complex neural processes, while the sensation had its chemotropic analogue even before neural tissues had been evolved from the more general protoplasmic basis. But whether there was any sensory consciousness before there was feeling consciousness is another question and cannot now be determined. However, it is almost certain that there was neither sensory nor feeling consciousness so long as the action of the organism was on a purely instinctive basis.

Consciousness of all sorts apparently is coördinate with and dependent upon habit development. Consciousness comes in the higher organisms with variation of the response, and it probably has always had the same correlation phylogenetically. Hence, in the twofold classification of controls of action and methods of evaluating conduct set forth in the beginning of this paper, the six terms in each list do not definitely correspond, if we always have consciousness in mind as an attribute of evaluating processes. For that reason,

the first term in the classification of the technique of evaluation and orientation, corresponding to chemotropism in the other classification, has been made Primitive Sensory Orientation instead of Sensory Evaluation. Consciousness of distinction and conscious valuation are not implied by the term. In fact, perceptual valuation and orientation of a definite sort probably did not appear before the fourth stage of activity control, that of overt habit organization, was reached. Definite perceptions of a discriminatory sort arise only when there is some sort of critical assemblage and correlation of sensory processes. But there is conceivably some kind of vague sensory consciousness much lower down in the scale of neuro-psyhic development. It is possibly fairly well developed even in the upper stage of instinct dominance, for instinct action patterns are dependent upon nervous processes and these are not wholly and irrevocably fixed by inheritance even in the lowest forms. Wherever there is habit modification, even under the dominance of instinct, there may also be vague sensory experiences, although they should not appear as definite perceptions. Perhaps, on the other hand, we should not speak of any sort of sensory consciousness, or consciousness of any sort, as existing before the cerebral organ has attained a fair degree of development.

There seems to be justification for assuming that feeling, in the form of pleasantness and unpleasantness, appeared in the stage of the dominance of instinct. Or, if it did not appear as a conscious experience thus early in animal evolution, because of insufficient cortical development, at least the neural mechanism for it had appeared, and there was lacking only the additional neural mechanism, the cortical coördinating processes, as the organ of consciousness, to make it a full-fledged reality. Feeling structure and feeling experience are mainly coördinate with habit control and not with instinct control, although at least the feeling structure must have appeared under instinct control dominance. The neural structure which is basic to feeling experience is the correlate of modification of the neural structure previously existing, whether instinctive or acquired. Briefly stated, the feeling

of pleasantness appears only where there is increasing correlation or fusion of nervous processes leading towards some further organic adjustment—originally an overt organic adjustment. Unpleasantness (sometimes miscalled pain) appears only where there is increasing interruption of neural processes which have been mediating some sort of an adjustment process, overt or internal—originally, doubtless, an overt organic adjustment process.¹ These modifications of nervous structure, involving increasing supplementation or interference of functioning processes, would conceivably occur wherever habit adjustments were being made.

If the feeling correlates appeared in the stage of the dominance of instinctive controls, they must have been even more prominent in the next stage, that of the dominance of overt habit. Here, apparently without a doubt, if not before, feeling existed as a conscious experience. The cortex was no longer rudimentary or absent. Here also conscious sensory experience was doubtless operative, although all of the twenty-two types of sensory mechanisms² known to man may not as yet have been fully developed. Sensations were doubtless still more or less vague and poorly correlated. Sensory experience and feeling were blended to form what, for lack of a better term, we have learned to call emotion. Emotion is not, like feeling and sensory experience, an independent psychic unit. It has its feeling tone, pleasant or unpleasant, and its sensory or cognitive element, which varies from vague sensory experiences or disturbances in the lower emotions to well-defined perceptions and even concepts in the higher emotions. The feeling or affective aspect of emotion is not capable of a very marked degree of differentiation, owing to the relative simplicity of the feeling consciousness. But the sensory or cognitive element in emotion is capable of almost infinite differentiation, because of the variety of sensory forms and the vast number of permutations of organization and intensity which they may take on. This aspect may be called the recognitive element in emotion and accounts for the rich-

¹ See Meyer, M. F., 'The Nervous Correlate of Pleasantness and Unpleasantness,' *PSYCHOL. REV.*, 15, 201-216.

² Herrick, *op. cit.*, 79.

ness of emotion, especially in its higher forms, though not for its intensity.¹

Whether emotion was the original conscious experience, as the older psychologists believed, is perhaps not yet fully determinable. Perhaps the answer to the question must largely turn upon a question of interpretation. Under the influence of the theory of original homogeneity in all things (which Herbert Spencer so aptly stated for us in his general law of evolution) we have at least since the day of Vico—if not from even an earlier time—held that things were originally without form and void and gradually took on shape and acquired definiteness of being. Thus it may be logical to contend that emotion, as the first form of consciousness, vague and relatively undefined, affective rather than intellectual, arose out of the unconscious or insentient organization of life, and that this emotion in turn unfolded into definite derivative aspects of feeling tone and sensory experience, and that the latter has further evolved into definite perceptions and conceptual thinking. If we assume that consciousness did not appear in any form until the cerebral cortex had reached a certain advanced stage of development, even though the lower neural correlates of sensation and feeling had long before appeared, it might be possible to make out a fairly good case for the theory that undifferentiated emotion preceded the more highly differentiated and derivative aspects of feeling and sensation in conscious experience. But however plausible logically this theory may be, given certain premises, one may suspect that it is largely metaphysical and a prioristic. From a behavioristic standpoint we know that the nervous structures which now serve as the correlates of sensation and feeling were present very early. It is, perhaps, less important to determine the presence of the correlated conscious content.

The related question as to what is the function of consciousness in an adjustment situation may well arise, as it has often arisen before. Does consciousness serve as a guide to a

¹ The theory of emotions stated here is based on an analysis of emotions contained in ch. 18 of a forthcoming work entitled 'Instinct.'

more effective adjustment, or is it merely concerned with an evaluation of the adaptation after the fact? Is it functional, or is it purely epiphenomenal? Is the whole of the adjustment process mediated by the neural organization and reorganization with which consciousness is correlated, or does consciousness itself somewhere turn the scale of action due to the organism's experience of pleasantness or unpleasantness, or the recognition of relative efficiencies in technique worked out in the cognitive consciousness? Is the great coördinating cerebral cortex only a vast and intricate machine which emits, as it works, a phosphorescent-like glow, which we call consciousness, or is that glow itself an essential part of the working of the machine? This is a metaphysical question which no one has ever been able to answer; it is a metaphysical question *because* no one has been able to answer it. But the fact is that, in the higher organisms at least, consciousness is closely correlated with neural structure, and we assume that it is functional in the adjustment process. Whether it does its share of the work or is only the phosphorescent glow which lights up the work done, it nevertheless affords us a good means of understanding and measuring the efficiency of the actual adaptive adjustment which is going on. Consciousness may or may not help to orient the organism; it unquestionably evaluates that orientation. And we assume that it plays an increasingly important rôle in the orientation process itself, its efficiency increasing according as it becomes more highly differentiated and specialized from feeling and vague sensation into definite perception and abstract concepts, with all the content of conceptual thinking which so dominates modern complex civilized life.

Perceptual thinking, which becomes well-defined when habits begin to be internally organized, is the psychic aspect of the reorientation of adjustment activities on the basis of acquired variations from the instinctive action patterns. Perception means the organism seeing the objects with reference to which it orients itself. Vague, unorganized sensations merely indicate that the objects are in the environment, but the reaction to the objects which accompany the vague

sensory experiences are primarily local; they afford no adequate grasp of the situation which enables the organism to make a comprehensive adjustment. The perceptual organization of sensory processes—primarily exteroceptive sensory processes they are—works markedly in the direction of comprehensiveness of adjustment. Conceptual abstraction and organization of perceptual consciousness mediates an even more comprehensive orientation or adjustment to the objects of the environment. Conceptual thinking, when highly developed, even helps the organism to see many—very many—objects requiring adaptation or orientation at once and in relation to each other and collectively in relation to the subject organism. As each science grows, with its vast fund of symbolic or abstracted concepts, our chance for an ever more comprehensive orientation and adjustment to our world increases, until even now man is supreme in a world where only a few centuries ago he was struggling with nature for survival.

The fifth stage of valuation and orientation, the conceptual, does not develop until language appears as a method of symbolization and abstraction of the relationship values to be used in the adjustment process. Psychologists have long recognized the mutual dependence of language and conceptual thinking. If perceptions are concrete views or conscious pictures of those aspects of the environment which immediately impinge upon the organism through its senses, concepts are abstracted and synthetic views of those impinging environments seen in relationship to each other and to the organism. Concepts serve as extensions of the senses through which they are built up. The cerebral cortex sifts, compares and generalizes the sensory material in order to give us concepts or perspectives of our relationships to the outside world. The value to the organism of conceptual organization of the neuro-psychic technique is superlative. It is the means by which we see beyond the present into the future and beyond the visible and the audible into the wider world of indirect relationships. It enables us to organize the world on a large scale and in two dimensions, instead of merely on a small scale in one dimension. It permits us to see ourselves, even in ab-

stract relationships, in relation to our contemporaries, that is, it puts unity for us into a very large world, a world which, with the development of modern science, extends beyond the confines of country or planet and comprehends the invisible micro-organisms and the chemical elements, as well as the monsters of the animal world and the terrors of the physical world which intimidated our ancestors. It also enables us to see the consequence of our acts, those remote as well as immediate, future as well as present.

The growth of conceptual thinking among civilized men can be measured by the development of their languages. Words and the combinations of words indicate the extent to which men are thinking abstractly and synthetically, in terms of remote and hidden relationships, and causally and constructively. In these respects modern man has travelled far from the most primitive types of men, who more nearly compare with the apes and the domestic animals. It is especially in science that man has made his greatest advance in the conceptual organization of neuro-psychic technique. The sciences, and all forms of culture and art in a certain sense, are orderly systems of concepts or synthetic and highly abstract methods of viewing environmental relationships. Science does two things of paramount importance for a concept-making and using organism. It defines and delimits these synthetic and abstract views of environment, and, secondly, it labels and pigeonholes them so as to render them readily and immediately usable.

Perception always indicates a sensory contact between the organism and the organism's environment. It cannot arise wholly from within. Even in the case of illusion or internal augmentation or distortion of the sensory processes from without—and this always happens to some extent in all perception—the modification in point is determined by past perceptions which remain as associative memories. But perception is a very limited and impressionistic measure or picture of the relationship of the impinging environment to the organism. It is likely to touch only the high places of contact and importance, or those which previous perceptions

have predisposed the organism to perceive. The concept, however, affords a much more balanced and adequate picture of the environment as a whole, although it is not photographic in its details. It is by far the more adequate neuro-psychic technique with which to measure and mediate adjustments to the environment, just because it is so abstracted and symbolic and synthetic and therefore so widely inclusive.

The multiplication of perceptions and of the power of an organism to perceive objects is in effect the process of differentiating the environment of the organism, and it is the basis for the increasing powers of the higher organisms to vary their reactions to environment selectively. But the growth of a conceptual or abstracting and synthesizing organization or technique in the mind multiplies many fold—almost indefinitely—the power of the organism to make selective adjustments to environment. The growth of perceptual and conceptual thinking has its correlate in environmental analysis. For each perception some defined object or group of objects stands out in the environment. For each concept in the mind some new synthetic relationship between objects in the environment and between that group relationship and the organism is defined. Thus, thinking is seen to be a process of creating a contact relationship with environment; it is a method of securing an ever more refined adjustment to our environment. The more abstract the thinking, provided the symbols and the logic are good, the more comprehensive and effective that relationship becomes.

For the metaphysician the question has arisen as to whether the environment produces the thinking or whether the thinking creates the environment. On the side of the latter view we have Berkeley and the solipsistic thinkers generally. Aligned with the former theory are the philosophic realists and the scientists. The most that we can say for the subjective view, probably, is that one's heredity and previous experience predispose toward the perception and comprehension of some things as against others. But psychological experiment shows that we inherit little or none of the symbolism of perception. It is only under the constant pressures

of the environment that we learn to perceive distance, forms, colors, tones and overtones, pitch distinctions, odors and tastes. The sensory impressions, especially respecting a human and social world, are largely amorphous as far as inheritance is concerned. The largest and most onerous function of our institutions, including the schools, is to teach the individual to perceive and conceive his environment with sufficient effectiveness to enable him to negotiate an effective adjustment. Conceptual thinking is built up wholly under the guidance of environmental pressures. There is not the slightest rudiment of conceptual thinking as such in the heredity. Nor is it ever developed beyond the barest rudiments except under the influence of a fairly well organized psycho-social environment.

The final stage of evaluation and measurement is that in which the method of science develops—particularly the mathematical-statistical method—and becomes a part of the psycho-social environment. The early conscious tests of the value of conduct are subjective. The feeling test is particularly subjective. The only objective reference of the feeling judgment is the immediate success or failure of the adjustment as indicated by the presence of increasing supplementation or interruption and conflict of neural processes. And this test is not strictly dependable, even for the most immediate and elementary adjustments of the organism. Unless aided by conceptual thinking, by means of which the adjustment is projected into the future and beyond the immediate environment, the feeling valuation of conduct is wholly worthless for anything except the most hand-to-mouth types of adaptation. Objectivity, bringing with it breadth and permanency of judgment in adjustment situations, comes along with the addition and growth of the intellectual elements. A conceptual judgment of adjustment values can be as objective and as permanent and universal as the concepts are accurately inclusive of the present and future relationships of the organism and the environment. No doubt we have attained a high degree of accuracy in this respect with the aid of conceptual analysis and synthesis. We have developed mathematical

methods of measurement as an aid to accuracy of judgment, and we are now extending these mathematical measurements into the field of social relationships as social science. Also, as pointed out earlier in this paper, we are accumulating vast stores of mathematically measured and tested data, so that our knowledge of situations may, as far as possible, cover the whole range of the technique of present and future adjustments.

As we have already seen, there were decided limitations to the effectiveness of adjustments so long as they were mediated only from within. The active neuro-psychic technique is not capable of carrying either all of the data or all of the methods of measurement—*formulæ*, laws, principles—which are necessary to a dependable and objective adjustment. So we have come to store externally the major part of both the data and the methods. Man's accumulation of a psycho-social environment has been a long and painful process. It is the process of the attainment of civilization. But it is now his dominant environment and it shapes his thinking. It contains the truly objective material out of which he builds his conceptual thinking in each generation, and it trains him in conceptual thinking and objective analysis. Its complete and effective development had to await the coming of the written language which made possible complete stabilization and accuracy of symbolization and the storage of potential neuro-psychic technique or habit in an unlimited volume. In other words, when man reaches a limit beyond which he cannot proceed with maximum efficiency in carrying within his memory conceptual methods of environmental analysis and the resulting data for objective or overt adjustment, he stores the overflow of conceptual content and of valuational *formulæ* in his external psycho-social environment and draws upon it when he has need.

Thus we have come to possess vast libraries of this measurement or valuational technique and resulting data, and these are increasing in volume and value of content at a rapid rate. They grow with the growth of the sciences, especially of the social sciences. The accuracy and effectiveness of our

adjustments depend upon the extent to which we make use of this fund of data and measurement technique in evaluating them. As the extent and accuracy of these externally stored aids to effective adjustment increase, as they come to occupy an even greater portion of our institutions and psycho-social environment generally, it becomes increasingly difficult for the human mind to avoid utilizing their content. All institutions and connections in the psycho-social environment have their roots in the human mind, although the overwhelming bulk of their content may be stored outside of these minds as potential consciousness or other neuro-psychic habit technique. These connecting roots which enter the minds from the externally stored method and data content of the psycho-social environment are representative of this content and present it to consciousness upon occasion. In this way the organization of the inner neuro-psychic technique is directed and dominated by the external storage content which has accumulated. The larger the content of the externally stored psycho-social environment the more effective its domination of both the content and the method of the thinking and habit reactions of the individual mind.

This, however, does not mean that in the future we may expect our thinking and our adjustments to become fixed and unchanging. On the contrary it signifies that by this means we escape further and further from the fixity and monotony of instinctive adjustment or biological determinism to the ever growing flexibility of an acquired adjustment technique which has finally come to be objectified in order that it might increase in volume and effectiveness and flexibility. From a few typical adjustments we evolve, under the direction of the new technique into an infinite number, each one intelligently adapted to the particular needs of the concrete situation. This means a vast improvement in the chances of survival and in the effectiveness of living. On the valuational side, after consciousness makes its appearance, the externalization of the technique of adjustment substitutes for the old hand-to-mouth type of subjective feeling judgment or evaluation, which was retrospective and highly inaccurate and limited in

range and time, an objective intellectual evaluation which approaches as closely to infallibility as it approaches to completeness of data and accuracy of measurement of environmental relationships. It is, in effect, the process of evolving our criteria of adjustment values from a subjective feeling technique to an objective and intellectual social science.

There is no way in which man can escape the crude and primitive physical environment of animal life and master his world except by coming completely under the influence of the new cultural or psycho-social environment which has grown out of the objectification and external storage of the neuro-psycho adjustment technique which he has evolved in the process of reacting more intelligently and more selectively upon his old environment. Instinct was but a bond through which the old relatively fixed physical world maintained its mastery over man. The new rational and acquired technique of adjustment, which is not at any one time even organized primarily within him, permits of much greater flexibility or freedom of adjustment. It is ever growing and changing for he creates it as it creates him. But it grows in accuracy as it increases in volume. He changes masters, from the old environment to the new, but the new psycho-social environment is a part of him, an extension of him, it is of his kind. It is constantly being transformed from the vague subjective feelings and fancies and superstitions and opinions, which his unintelligent contacts with physical nature inspired in him before he had an objective technique for measuring adjustment values, into a content of scientific method and data which frees him from fear and suffering in so far as he organizes his conduct in accordance with it.

My conclusion, therefore, is that the viewpoint of biological determinism set forth by such men as McDougall among the philosophers and psychologists, and Galton and C. B. Davenport among the biologists is not tenable. Environment now dominates man and always has dominated and molded him. Instinct was merely a technique by means of which a crude and undifferentiated, unintellectualized and unhumanized physical environment accomplished

its results. It was created by this environment through selected inheritance and served it. The whole process of human and animal evolution seems to have been away from the fixity of instinctive over to the flexibility of habitual and potential habitual or externalized neuro-psychic adjustment technique, on the one hand, and from subjective feeling criteria of conduct in adjustment over to intellectual criteria, which arose and were perfected out of the sensory responses to environment and which finally came in large measure to be stored outside of the individual consciousness. In this way the later criteria have become increasingly objective and accurate and effective for the widest and longest time adjustment ends.

The assumption that instinct dominates the formation of acquired neuro-psychic adjustment technique or the criteria of values of conduct in adjustment is also incorrect. These processes appear only as instinct disappears or is rendered subordinate in their organization. The new psycho-social environment, built out of the objectification of this internal neuro-psychic adjustment technique, dominates the organization of these processes and relegates instinct to a position of diminishing importance. It even tends to select instinct out of the inheritance of man,¹ although in its simpler forms of tropism and reflex it will doubtless always have a function in serving as raw materials from which habit patterns may be built.

Our social organization, therefore, is not built primarily upon biological inheritance, but upon the social and psychological transmission of internally and externally stored acquired neuro-psychic technique. We shall not perfect our social organization through eugenics or the breeding of biological traits (however valuable this may be for the achievement of certain elementary and basic results in health, strength, and general capacity), because the most valuable traits and characteristics in society are not biological, are not transmissible through the chromosomes. They are trans-

¹ Bernard, L. L., 'Misuse of Instinct in the Social Sciences,' *PSYCHOL. REV.*, 28, 107.

missible only through the acquired technique of men's minds and the books and other external storage technique which are in the nature of potential habits and ideas.

The biologists who have been so scornful of the ignorance of scientific method and the laxity of its application by the sociologists, are mainly responsible for this egregious error. They have been guilty of attempting to settle the most important of all questions in the social sciences—the question of the organization of control technique—by means of an analogy. Having mastered the mechanisms of the lower organisms, but being astonishingly uninformed in the principles and data of psychology and sociology, they have had the temerity to insist that the sociologists should accept their analogical conclusions with regard to sociological method and fact. The situation is not now so bad—or so humorous—as it once was. A decade or two ago their intolerance of the environmental interpretation was so great that the sociologist scarcely dared own to his views and many of the tribe adopted bodily the interpretations of the biologists about inheritance, and those of the biologically dominated psychologists about instincts. Now almost no sociologist is so poor as to pay heed to the instinct classifications of the McDougall type, and Sociology is at last shaking itself free from biological dominance and is developing an objective and a method of its own. Thus it promises to become a science, not merely a poorly organized and presumptuous branch of biology, as some of the biologists formerly seemed to regard it.

CONCEPTIONS OF CEREBRAL FUNCTIONS¹

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Histories of political events, of literature, or of scientific achievements, show two modes of dealing with events. In one, facts are recorded in sequence; rulers and generals, writers and discoverers are named and their accomplishments or failures are described and set off into periods of time. In the other, the historical function is considered that of showing relationships in thoughts and actions at different moments and, to use psychophysical terms, of pointing out the kinds of reactions that result from certain environmental stimuli, and the emotional and thought trends that predominate or wane. It is this latter kind of history that has recently been widely recognized to be valuable for the understanding of scientific discoveries and conceptions, and for understanding of political events which now, except in the elementary schools, are taught to show racial values, state relationships, and personal heritages.

In considering the development of scientific notions and endeavors cyclic recurrences are apparent. The astrologers believed in the influence of the stars upon the individual's life, the modern astronomer and the meteorologist understand that the stars affect the lives of all. The alchemist hunted for the philosopher's stone, but it remained for the investigator of radium emanations to discover that the transmutation of elements may be nearer than the end of the rainbow. The necromancer has his parallel in more respectable quarters in modern life, and the long time search for the fountain of youth and the elixir of life goes on in slightly different ways but is directed towards the same goal as of old. But it is not only in the larger subjects of inquiry that these recurrences are to be noted. In smaller fields or topics which

¹ Read before the Historical Section of the New York Academy of Medicine, January 30, 1923.

have attracted attention for periods of time the cycles are obvious. In none is this more evident than in the consideration of the functions of the brain. This will become apparent when we have noted both the present tendencies and their historical prototypes.

In most subjects—and this holds for cerebral explanations—the point of view is largely influenced by the interest of the teacher, investigator, or practitioner. If his functions are those of an immediately practical nature, concerned with the application of facts to difficulties he encounters, he is satisfied with explanations and adopts as hypotheses statements which have most immediate reference to his occupation. And if he has a general viewpoint, this viewpoint is frequently lost sight of in his daily work. If, on the other hand, he is seeking for what he deems the fundamentals, he loses sight of many of the immediately practical conditions, or he discards them as being too complex for his consideration, or regards them as unfitted for his purposes. It is this obvious difference in standpoint that has in part brought about the differences in the conceptions of cerebral localization, just as it has produced differences in conceptions of other bodily functions. But, when certain well defined facts are set forth, even though they appear to be contrary to the opinions generally held, they must be accepted and their wide acceptance brings about corresponding changes in the current belief.

The view expressed by Gall, subsequently amplified and modified by Spurzheim and his followers, is familiar. Disregarding the bump-palpation part of phrenology, it is in brief that the cerebrum is not a unified organ, but a collection of organs of diversified function. In contrast to that view is another which was best exemplified by Flourens, according to whom the brain functions as a whole in all mental (or cerebral) operations. Both of these views are important for us today because they are inherent in our present conceptions, to which we shall now turn.

The work of Broca and following him the results of investigations of other aphasic conditions brought to the fore the conception of a rather strict localization of mental events

or processes in localized areas of the cerebral cortex. The conception was further emphasized by the definite localization of the cortical area related to motor control which began with the work of Fritsch and Hitzig, and which continued during the following two decades with great energy. At the same time there was an accumulation of clinico-pathological data which in general confirmed the motor localizations as well as those of speech disturbances. The examination of patients with brain injuries and the subsequent investigation of the brains in those cases which came to autopsy, showed that there was a very close association between brain lesions and other defects. These facts were gathered for all three functional fields, motor, sensory, and associational. The facts were stated, however, not in terms of deficiencies, but of their opposites. In other words, accepting for the moment the questionable Broca localization, the statement made was that Broca's area is the area of motor speech. The clinico-pathological facts, are, however, to be stated thus: The patient with motor aphasia has a lesion in the left third frontal convolution. This difference of statement is a real difference, and not a supposed one.

The mental localizations corresponding but opposite to the clinical deficiencies were set forth as facts. But do the observations actually warrant such conclusions? Are not the statements to be looked at in a somewhat different fashion? In dealing with many of the so-called facts, are we not to a large extent dealing with interpretations? The facts which are acceptable on a strictly scientific basis are the records on the one hand of the clinical appearances, or symptoms, or syndromes, and, on the other hand, of anatomical defects observed in the brain. These, I take it, are the factual elements which we must accept. But other so-called 'facts' were injected into the accounts of these clinico-pathological investigations, and frequently also into those of the laboratory, which do not immediately adhere to the conditions which were supposedly described. Thus, writers on the aphasias actually gave a mental interpretation to the deficiencies which were found in their cases. They reported, as if it were

an observed fact, that the individuals had lost certain images, kinesthetic or visual or auditory, which losses were reasons for the clinical defects. And by other observers the paralyzes and anesthetics resulting from cerebral injuries, whether in man or animals, were also reported in a like fashion. It will be recalled, however, that Hughlings Jackson found that the so-called motor aphasic did not have a loss of kinesthetic images. In more recent years his early statement of protest has been supported by a number of investigators who have taken the trouble to record the clinical facts without burdening their statements with inferences, however plausible they may appear to be. We should distinguish then between an accurately described fact and the description of this fact in terms which, purposely or not, include many inferences or conclusions which do not directly pertain to the fact. Thus in the motor aphasic, which is taken as an example at this moment, we may accept as clinical fact an inability of, or a disorganization of the movements concerned in speech, and along with this the fact of an anatomical disorganization which presumably can be spatially localized in the cerebrum. These are two separate statements of fact which have, we believe, relationship, but it has been customary to say, but in reality to conclude, that the destroyed or disturbed cerebral area is the normal area for the production of normal speech, and that the speech function has been lost because of the destruction of the storehouse of memories or ideas.

So dominant had the belief in the 'faculty psychology'- 'cerebral pathology' relationship become that it permeated all the cerebral investigations on animals. Assumptions regarding mental operations in animals were prevalent, wildly constructed, and incoherently defined and defended. Images and thoughts, emotions, attention, memories, were invoked to explain certain behavior deficiencies in animals which had been deprived of parts of the cerebrum. Perhaps part of this may be accounted for on the score of inadequate knowledge, or inadequate vocabulary to describe what actually existed or happened, but part at least was due to the humanization or the taking of an anthropomorphic view of animal life

and intelligence. It is only on this ground that we can understand the use of the terms idiocy and dementia, and a host of others, as descriptive terms relating to animals whose brains had been operated upon. The wonder is greater in that in the remainder of physiology, objective reactions were being studied, and physiology was becoming (as it is now frequently defined) the application of the principles of physics and chemistry to the animal mechanism.

We laugh, or at least smile, at the Cartesian localization of the soul in the pineal body, but the same kind of reasoning is the tool used in the construction of the cerebral-mental localizations which have been considered. The sequence of reasoning is somewhat as follows: The brain is the organ of mind; the mind is a compound of faculties, functions, attributes, qualities, or parts; and the different mental parts are localized or localizable in different divisions of this mental organ. This view is what I think can rightly be called phrenological, but if that term has for anyone an unhappy, inapt, disagreeable, or repugnant connotation, another word of Greek, Latin, or even Oriental origin may be substituted.

It is on this same phrenological ground that many of our recent studies have been built, and with an increasing knowledge of brain structures the mental localizations have been reported in more precise, but not necessarily in any more exact, spatial terms.

Absurd though the view may be as a philosophy, there can be no doubt that it has value as a clinical tool. And, if it is understood in this way there can be no objection to it. It is when the acceptance of the view leads to unwarranted beliefs, that its illogical assumptions must be set forth and the conclusions must be dismissed. It has value in pointing out the usual collocation of clinical syndromes with brain lesions. It has value also after the anatomical diagnosis is made, in determining for example whether or not the brain defect can be surgically reached and dealt with. But its value in these two directions is limited; since it is recognized that the important localizing symptoms are not the main obvious defects, but the concomitant phenomena.

It is when the explanations are extended beyond this point that they must be bolstered up with accessory assumptions. This is seen in some of the speech function localizations. Quite apart from the difficulties of explanation of a 'faculty' localization, the so-called negative cases are of interest. These negative cases are assumed to be positive cases, and the conclusion is arrived at through a further assumption that is gratuitous. This assumption is that if the left Broca area or the left temporal lobe is destroyed in a right-handed individual without an accompanying aphasia, the individual must have been dynamically, originally, or congenitally, left-handed, and that the righthandedness was acquired. This sounds much like the dialectic of the Middle Ages.

The negative cases of aphasia of different types, and other cases which may briefly be catalogued point to another view of cerebral function which is more closely associated with the views of Flourens. The main facts are those of functional restitution or reëducation after cerebral lesions, the phenomenon of recovery after nerve anastomosis, and certain individual structural and functional differences in brain actions or patterns. Time will permit only the mere citation of the results which are important for us in this connection.

It is well recognized that the same external stimulus when given to two individuals may result in different reactions, and that the same stimulus given to an individual at two successive moments may give rise to two different reactions. These individual differences and these moment differences are to be understood largely as differences in cerebral conductions, in one case the afferent impulse leading to an efferent element in one place and in the other case to a differently located efferent element.

The functional recoveries after some instances of nerve anastomosis and in other cases of muscle splitting bring forth many pointed questions regarding cerebral localization. When an anastomosis of the central end of the accessory has been successfully made with the peripheral end of the facial, does the patient use the cerebral motor cells for the shoulder

when he smiles and, if he does, how does it come about that the mimetic movements are correctly performed bilaterally? Does he have to think about smiling with one side of the face and shrugging his other shoulder at the same time? If not, what becomes of the localization explanation of kinesthetic images? If in another case, the soleus muscle is split, part remaining attached for extension and part being brought to the anterior part of the leg for flexion in place of a paralyzed anterior group, how can the recovered patient, having a kinesthetic image of extension both when he wants to flex and when he wants to extend his foot, carry out either movement at will?

The patient, who after an extensive cerebral insult producing a hemiplegia has recovered some motor ability sufficient to enable him to acquire some new habits or movements, also makes an interesting study. How can we account for the recovery of ability (assuming that the cortical motor cells have been destroyed)? Surely whatever images pertained to these individual cells must have disappeared with them. And shall we then conclude that new images are created in some other part of the brain, such as the lenticular nucleus?

And, for the patient with aphasia, either sensory or motor, how can we reconcile the recovery phenomena with the view of image store-houses in localized cerebral cells?

If we are to start with an established fact, anatomically and physiologically considered, we shall accept as this fact the conduction function of the cerebral cells. We may then deal with the phenomena pertaining to pathology and reëducation as well as with those of a normal character. We shall then understand that differences in individuals or moment differences are due to variations in conduction paths. We shall also understand that in the phenomena of nerve regeneration, nerve anastomosis and muscle splitting, we deal solely with differences in conduction pathways and that in reëducation we have also the same general condition. We take no philosophical theory of mind and body, but we deal with the nervous system in general as a great connecting system which

receives stimuli from without itself and transforms these stimuli into efficient efferent channels to bring about adjustments of the organism. And at the same time many of the pathological phenomena point directly to a possibility of different pathways for the junction of the afferent with the efferent.

It is the latter series of facts that especially points to a functional substitution which is not understandable on the phrenological hypothesis, and the acknowledgment of functional substitution bears a direct relation to the view usually referred to Flourens. It is this which is inherent in much of the work of von Monakow and in the recently published investigations of the Vogts. Many parts of the brain function at one time, and so widely separated are those parts that we have right to say that the brain functions as a whole.

This does not mean a return to Flourens, it means only that the accumulation of facts shows clearly the inadequacy of the phrenological or faculty view as an explanation, and the necessity for a more adequate general statement. It also means that the distinction should be drawn between a general explanation and those deductions that have immediately practical applications. And, furthermore, it means that however much our practical needs are met by an explanation, an explanation is not more than a verbal summary, to be added to or subtracted from as newer practice evolves.

Fundamentally there is no real opposition between the phrenology of Broca and more recent writers and the whole brain hypothesis of Flourens as we now have modified it. But the phrenological view, leaving out the conception of the storage of ideas, must be understood in its proper place as a diagnostic approximation, and the original view of Flourens is the more general view which we must also modify in the light of our accumulated knowledge. It is the latter viewpoint, changed in accordance with more recent experiments, that more clearly helps towards the understanding of the cerebrum.

The value of a working hypothesis, or of a theory, is in how far it can help us to understand both the old and the newly discovered facts, and in what degree it is stimulating

to further investigation. Any theory is bad when its votaries worship tradition rather than fact, and when they proclaim as heretics those who dare to disagree with them. It is, I believe, the modified form of the belief in the utilization of the cerebrum as a whole in our adjustments—mental operations if you wish to use the term—that is at present most stimulating and more inclusive.

History has a number of things to teach us; not to perpetrate the errors of our forebears, not to attempt to justify mistakes, but, recognizing what was accomplished by others, to profit by established fact, to react to the present situation making use of our family heritages, and to get rid of those racial, occupational, and personal prejudices which produce maladjustments and which prevent appropriate reactions to the present situation.

INSTINCT AND PSYCHOLOGICAL VIEWPOINT

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A survey of representative current psychological textbooks reveals the fact that various authors deal with the topic of instinct in widely different ways. This is indicated, in the first place, by the varying amount of space allotted to the subject, and, secondly, by the unequal prominence that the term receives in different texts. Some authors¹ accord this topic the significance of a separate chapter heading; a few² extend their discussions of instinct over two or more chapters; several bracket instinct with some closely related topic, such as emotion³, habit⁴, reflex action⁵, within a single chapter; while others pay tribute to the term in a few paragraphs or pages in connection with their treatment of action or reaction⁶, impulse⁷, behavior⁸, animal consciousness⁹ or consciousness and behavior or action.¹⁰ The divergence of treatment is disclosed, thirdly, by widely different

¹ James, W., 'Psychology,' II, ch. 24; Warren, H. C., 'Elements of Human Psychology,' ch. 10; Pillsbury, W. B., 'Essentials of Psychology,' ch. 10; *ibid.*, 'Fundamentals of Psychology,' ch. 12; Stout, G. F., 'Manual of Psychology,' Book 3, Part 1, ch. 1; Watson, J. B., 'Psychology from the Standpoint of a Behaviorist,' ch. 7; Calkins, M. W., 'A First Book in Psychology,' Sec. 5; Seashore, C. E., 'Introduction to Psychology,' ch. 15.

² Angell, J. R., 'Psychology,' chs. 15, 16, 17; Watson, J. B., 'Behavior,' chs. 4, 5; McDougall, W., 'Outline of Psychology,' chs. 3, 4, 5; Woodworth, R. S., 'Psychology,' chs. 5, 6, 8.

³ Titchener, E. B., 'A Beginner's Psychology,' ch. 8.

⁴ Judd, C. H., 'Psychology,' ch. 8; Dunlap, K., 'Elements of Scientific Psychology,' ch. 11.

⁵ Hunter, W. S., 'General Psychology,' Part 2, ch. 3.

⁶ Titchener, E. B., 'Textbook of Psychology,' 462 ff; Ogden, R. M., 'Introduction to General Psychology,' 163 ff; Dunlap, K., 'A System of Psychology,' 277 ff.

⁷ Külpe, O., 'Outlines of Psychology,' 328; Dewey, J., 'Psychology,' 353 ff.

⁸ Warren, H. C., 'Human Psychology,' 102 ff.

⁹ Wundt, W., 'Outlines of Psychology,' 317 ff; Calkins, M. W., 'Introduction,' 371 ff.

¹⁰ Breese, B. B., 'Psychology,' 397 ff; Major, D. R., 'Elements of Psychology,' 357 ff.

modes of defining the term itself, and finally by differences in the nature and substance of the discussions which the topic receives at the hands of the different writers.

The present paper aims roughly to point out the extent and nature of this lack of harmony in the treatment of instinct and to offer what appears to be a plausible and rather self-evident explanation of these discrepancies. It is not our purpose to carry our study beyond the current textbook level. Many extended controversies over mooted points are to be found in the periodical literature which at most receive only a passing mention in the textbooks. This is doubtless due to the fact that frequently questions of fundamental importance are not brought to such a degree of finality in these discussions as to allow straightforward and dependable conclusions to come to light in the texts.¹ We shall, consequently, confine ourselves to the task of exhibiting the degree of disharmony existing in present-day textbooks and discovering its underlying basis.

It would be unusual were we to find perfect or even substantial agreement in the definition of the term instinct. For, other traditional psychological terms have been subjected to an extremely varied usage. For example, *feeling*² has had a very loose and flexible usage. The term *consciousness*—the Alpha and Omega of the 'empirical or functional' school—has recently been summarily dismissed by two eminent psychologists.³ *Sensation*, although defined somewhat differently, might have been regarded as one of the last terms to meet such an extreme fate, but it has recently been intimated that the time has probably come for psychologists to shelve this

¹ As a pertinent illustration the reader may be referred to the sharp controversy at present waging; see: Dunlap, K., 'Are there any Instincts?', *J. of Abn. Psychol.*, 1919, 14, 307-311; *ibid.*, 'The Identity of Instinct and Habit,' *J. of Phil.*, 1922, 19, 85-94; Kuo, Z. Y., 'Giving up Instincts in Psychology,' *J. of Phil.*, 1921, 18, 645-664; *ibid.*, 'How are our Instincts Acquired?', *Psychol. Rev.*, 1922, 29, 344-365; and McDougall, W., 'The Use and Abuse of Instinct in Social Psychology,' *J. of Abn. Psychol. and Soc. Psychol.*, 1921-1922, 16, 285-333.

² Cf. Stumpf, C., 'Über Gefühlsempfindungen,' *Zsch. f. Psychol. u. Physiol. d. Sinnesorgane*, 1907, 44, 1 ff; Titchener, E. B., 'Textbook of Psychology,' 225 ff; and Warren, H. C., 'Human Psychology,' 279 ff.

³ Watson, J. B., 'Behavior,' ch. 1; Titchener, E. B., 'A Beginner's Psychology,' p. x.

orthodox term as obsolete.¹ And the term *psychology* itself receives about as many shades of definition as there are textbooks of psychology.

It is not at all surprising, then, to find that the term instinct has had a similar eventful and indeterminate history. In fact, its course has run so true to form that Watson² seriously considered replacing the term by another with a less unfortunate and indefinite past. He says, "Modern writers have given no fixed meaning to the term instinct. The word is in common usage in a number of different departments of study—philosophy, psychology, and biology. These separate divisions use the word in widely different ways. Probably no other term, unless it be that of consciousness, is more handicapped by its history. As one wades through the enormous literature and meets the widely different meanings attached to it, one is almost tempted to employ some other word. But in spite of its past the term is short, useful, and convenient." Titchener³ expresses a similar opinion. "Instinct," he writes, "has long been one of the catchwords of popular psychology; even now it stands next only to 'feeling' in looseness of usage and multiplicity of application." And Pillsbury⁴ also concludes, "So general has been the use of the word, in fact, that some writers desire to give it up as too vague. However, so many important facts may be grouped under the term, and the series of activities it describes is so important, that it seems much better to retain the word and to state clearly just what it is and what it is not to mean."

Yet, despite this loose and varied usage, it appears in the opinion of several authors still desirable to retain the term as a concept under which to subsume certain psychological data. The point should not be overlooked that, amid all these cross-currents, we find many common connotations of meaning running consistently through practically all textbooks. (1) All authors employ the term to cover those acts or responses which are executed by an organism without any previous

¹ Ogden, R. M., 'Are there any Sensations?', *Amer. J. of Psychol.*, 1922, 33, 247-254.

² 'Behavior,' 106.

³ 'Textbook of Psychology,' 462.

⁴ 'Fundamentals of Psychology,' 421.

training or experience in performing the act—such responses, for example, as Thorndike¹ terms 'unlearned.' Wundt² has used the term in a broader sense, to include also such habitual responses as have been reduced to the point of automatic activity, but this extension of meaning is abandoned in practically all present-day textbooks.³ (2) The authors agree, in general, that impulsive action is a prominent psychological datum in a typical instinctive performance. (3) It is generally assumed that some inherited mechanism, more or less definite, serves as a neurological basis for the execution of instinctive acts. (4) All writers explicitly point out or definitely imply the intimate interrelationship which holds between instinct and emotion. (5) It is generally conceded that an instinctive act is seldom executed without conscious experience attending it, though no unanimity of opinion prevails as to the precise rôle which consciousness plays in instinctive behavior. And finally, (6) it is generally accepted by those who are teleologically minded that the instincts serve the biological function of adapting the individual to his environment.

It appears, from the foregoing, that the flexibility of usage has hardly led to hopeless confusion; taking a broad prospectus of the expressed meanings we are able to glean a number of connotations attaching to the term upon which there is substantial agreement among the different writers. The marked divergence and antagonism of views pertain more especially to the minor features of instinctive action.

It is not possible to present a clearcut classification of the different kinds of definition that have been formulated for the term instinct. Some definitions are quite specific, while others are more general and comprehensive. Three rather distinct classes of definition are to be found, however.

Neurological Definitions.—Certain authors define the term essentially on the basis of the underlying nervous connections. This conception has its origin in Herbert Spencer's defini-

¹ 'Educational Psychology,' I, 5 f.

² 'Lectures on Human and Animal Psychology,' 388. Cf. also his 'Outlines of Psychology,' 317.

³ Such a view is still accepted by one very recent author. See Givler, R. C. 'Psychology—The Science of Human Behavior,' 47.

tion¹ of the term as a compound reflex. Since this type of definition stresses the nervous *Anlage* and also the relationship of instinct to the simpler physiological reflexes, we are warranted in designating it as the *neurological or physiological* type of definition. Warren² defines the term as, "A coördinated chain or group of diverse reflexes which work together systematically, owing to inherited neural conditions." And Watson³ says, "The student of behavior has come to look upon instinct as a combination of congenital responses unfolding serially under appropriate stimulation. . . . Each element in the combination may be looked upon as a reflex. An instinct is thus a series of concatenated reflexes." Angell⁴ characterizes the term similarly: "Instincts have an origin unquestionably similar to that of reflexes. They represent structurally preformed pathways in the nervous system, and stand functionally for effective inherited coördinations made in response to environmental demands. It is, perhaps, impossible to draw any absolutely sharp line between instincts and reflexes, although many principles of demarcation have been proposed." And Parmelee⁵ writes, "An instinct is an inherited combination of reflexes which have been integrated by the nervous system so as to cause an external activity of the organism which usually characterizes a whole species and is usually adaptive."

According to the neurologically minded authors, then, instinctive behavior involves a reaction of a more extensive part of the organism, while reflex action entails a response of only a limited or local part. A greater number of muscles and glands are included, and a larger number of movements are executed in instinctive action. But, as Angell asserts, an exact line between instinct and reflex can scarcely be drawn; just how complicated a reflex must become in order to qualify as an instinct can hardly be specified. Some writers, it is true, suggest that the reflex is mechanical in nature, whereas

¹ 'Principles of Psychology,' I, 432.

² 'Elements of Human Psychology,' 397.

³ 'Behavior,' 106.

⁴ 'Psychology,' 339.

⁵ 'The Science of Human Behavior,' 226.

the instinct is more purposive; but, as Pillsbury¹ points out, this distinction is not valid, since most reflexes certainly have a purpose even if explained by a mechanism. To draw the line on the basis of the complexity of the neurological pattern alone allows no sharp delimitation, since reflexes as well as instincts vary considerably in degree of complexity. The physiologist lists, in addition to simple reflexes, a large number of complex or compound reflexes, which supposedly involve more or less complicated nervous patterns. The distinction here is one of degree rather than of a distinctly different kind of pattern.

It is also suggested that consciousness is represented in instinct but not in the reflex; this, accordingly, is urged as a distinguishing criterion.² But there is no community of opinion as to the position which consciousness occupies in instinct. Lloyd Morgan³ has insisted that, although consciousness attends the execution of many instinctive acts, the instinct is controlled by subcortical centers, consequently, consciousness is merely an epiphenomenon or adjunct of the experience. In this connection Holmes⁴ states, "A brainless crayfish will walk, eat food, reject innutritious substances, defend itself when seized, and perform various other complex activities. . . . Many of the more complex activities of the animal may be explained as chain reflexes in which one act affords the stimulus to the performance of other acts." Such a citation is, of course, amenable to the perfectly valid criticism that we have no positive assurance that consciousness plays the same rôle in the execution of a human instinctive act as in that of the crayfish; arguing by analogy, however, has become a generally justifiable method in psychology, if a too precise agreement is not insisted upon.

Certain authors, on the other hand, insist that the conscious factor plays a significantly more potent and invariable rôle in instinct. McDougall⁵ says, "There is every reason to

¹ *Fundamentals of Psychology*, 421.

² Colvin, S. S., *The Learning Process*, 34.

³ *Instinct and Experience*, 32.

⁴ *Studies in Animal Behavior*, 30 f.

⁵ *Introduction to Social Psychology*, 26.

believe that even the most purely instinctive action is the outcome of a distinctly mental process, one which is incapable of being described in purely mechanical terms, because it is a psychophysical process, involving psychical as well as physical changes, and one which, like every other mental process, has, and can only be fully described in terms of, the three aspects of all mental process—the cognitive, the affective, and the conative aspects; that is to say, every instance of instinctive behavior involves a knowing of some thing or object, a feeling in regard to it, and a striving towards or away from that object.” Drever¹ also assigns the conscious element a more prominent position when he says, “Instinct is the ‘life impulse,’ becoming conscious as determinate conscious impulse. But this, in itself, is only one side of the psychological fact, and an abstraction. The other side—also an abstraction—is sensation. The psychological fact itself is experience in its lowest terms.”

The true relationship of consciousness to instinctive action is thus at present still under debate. At one extreme there are some who say that, although present in many instances of instinctive action, consciousness is only an adjunct to the experience; at the other there are those who assert its invariable presence in instinct. But in view of the fact that still other writers accept the dictum of Morgan, we are precluded from advancing this factor as a generally accepted distinguishing criterion between compound reflex and pure instinctive action. Woodworth² states that this distinction fails because certain typical reflexes, such as flexion or sneezing, which usually take place promptly and without conscious direction, become highly conscious when the response is delayed. On this evidence he concludes that the best distinction between these two types of response is that reflexes are usually executed promptly, while instinctive acts are characterized by a “persisting tendency, set up by a given stimulus and directed towards a result which cannot be instantly accomplished.”

¹ ‘Instinct in Man,’ 88.

² ‘Psychology,’ 109.

Biological Definitions.—The second type of definition states that upon the release of an instinctive act the organism makes a number of movements which vary somewhat in nature and which are directed toward the attainment of some unforeseen end. This view also assumes that the behavior series which eventually secures a certain end—avoiding danger, securing food, etc.—is the common possession of a large group of related species; it asserts, moreover, that instincts provide an important means whereby the organism secures adaptation to its environment. Inasmuch as this type of definition accentuates the rôle of instinct in racial history, it may be called the *biological* type of definition. The definition of James¹ belongs here: "Instinct is usually defined as the faculty of acting in such a way as to produce certain ends, without foresight of the ends and without previous education in the performance." The definition of Morgan² also belongs to this type. He defines instinct as "That which is, on its first occurrence, independent of prior experience; which tends to the well-being of the individual and the preservation of the race; which is similarly performed by all the members of the same more or less restricted group of animals; and which may be subject to subsequent modification under the guidance of experience."

The general end which, according to this view, instincts are supposed to achieve is the adaptation of the individual to his environment. The objection urged against this view is that many instinctive acts have no immediately and obviously adaptive or serviceable results.

Psychological Definitions.—A third group of authors define instinct on the basis of the strictly psychological data exhibited in instinctive acts; we may, accordingly, call this the *psychological* type of definition. McDougall³ says, "We may therefore define 'an instinct' as an innate disposition which determines the organism to perceive (to pay attention to) any object of a certain class, and to experience in its presence a certain emotional excitement and an impulse to action which

¹ 'Psychology,' II, 383.

² 'Instinct and Experience,' 5.

³ 'Outline of Psychology,' 110; cf. 'Introduction to Social Psychology,' 29.

find expression in a specific mode of behavior in relation to that object." The definition of Drever,¹ already cited, belongs to this type. The chief psychological data which these two authors find and upon which their definitions have been formulated are impulse, feeling and emotion, sensation or perception and attention.

Interpretations.—We have thus found in current textbooks three different types of definition for the term instinct. We are accordingly brought face to face with the question as to why authors formulate their definitions so differently. Our previous discussion has shown that instincts are many-sided and complex. This is indicated by the fact that several authors, who do not use the term as a separate chapter heading, employ it along with a number of other psychological topics. This is also shown by the flexibility of usage which the term has had in its history as a psychological concept. It is further attested to by the several common meanings which run consistently through practically all textbooks. In the light of these findings it seems plausible that the different modes of definition may have their basis in the fact that the instincts are highly complex and many-sided. Some observers approach this composite situation from the angle of neurology and physiology and deal with certain of the facts, or magnify them out of their proper perspective, while ignoring or minimizing others. Other observers approach the same complex situation from the biological point of view and stress those data which harmonize with the goal of their search, at the same time tending to overlook or undervalue certain other facts which are represented in the complex experience. The strictly psychological observer views the situation from still another point of vantage and renders quite a different account of the facts.

The accounts given by these different observers viewing the same complex situation from different standpoints² are not, however, utterly unrelated and incompatible. As a matter of fact, there is considerable overlapping in the

¹ *Op. cit.*

² The writer owes much to a course by Professor H. P. Weld, of Cornell University, from which his views regarding the divergence of current viewpoints had their inception.

accounts themselves. We find, for instance, that the two authors from whom we quoted in support of the biological type of definition admit also a neurological basis for instincts. James¹ says, "They [instincts] are the functional correlatives of structure." And Morgan,² "Such behavior is, I conceive, a more or less complex organic or biological response to a more or less complex group of stimuli of external and internal origin, and it is, as such, wholly dependent on how the organism, and especially the nervous system and brain centers have been built up through heredity, under that mode of racial preparation which we call biological evolution."

McDougall³ acknowledges the right of the neurologist or physiologist in the domain of instinct; "We cannot, of course, directly observe the three-fold psychical aspect of the psychophysical process that issues in instinctive behavior; but we are amply justified in assuming that it invariably accompanies the process in the nervous system of which the instinctive movements are the immediate result, a process which, being initiated on stimulation of some sense organ by the physical impressions received from the object, travels up the sensory nerves, traverses the brain, and descends as an orderly or coördinated stream of nervous impulses along efferent nerves to the appropriate groups of muscles and other executive organs." McDougall⁴ also implies that instincts have a biological aspect when he says that "among professed psychologists there is now fair agreement as to the usage of the terms 'instinct' and 'instinctive.' By the great majority they are used only to denote certain innate specific tendencies of the mind that are common to all members of any one species, racial characters that have been slowly evolved in the process of adaptation of species to their environment and that can be neither eradicated from the mental constitution of which they are innate elements nor acquired by individuals in the course of their lifetime."

The men who define the term neurologically or physio-

¹ *Op. cit.*, 383.

² *Op. cit.*, 5.

³ 'Introduction to Social Psychology,' 26 f.

⁴ 'Introduction to Social Psychology,' 22 f.

logically as compound, coördinated, concatenated, or integrated reflexes, in their turn admit that most instinctive responses have, or had at some previous time in the biological history of the organism, a beneficial or adaptive influence. Parmelee¹ even specifies this in his definition quoted above. And the other authors, as already indicated, concede that consciousness is a fairly constant factor in instinctive action, even though it is assigned a variable and indeterminate significance. It appears, then, that the differences of definition are prompted by differences of emphasis. All observers find, in general, the same set of facts, but their accounts and interpretations vary in accordance with the more or less definite viewpoints from which they undertake the observation of those facts. A more accurate definition would probably be comprehensive enough to include all aspects of the complex set of facts, and when one reads through the various chapters on instinct, instead of taking the authors' formal definitions of the term, one feels in many instances warranted in assuming that the writer had in mind a more comprehensive definition than his brief formulation covers.

Our discussion has made it obvious that instinct furnishes data for several distinct fields of study—physiology or neurology, general biology, and psychology. Many of its problems belong entirely to the biologist. It is exclusively his task to deal with the problem of the origin of instincts, *i.e.* to determine how mankind came into possession of such ready-formed modes of response. In like manner, it is the prescribed task of the neurologist to inquire into the nature of the nervous pattern underlying the instincts, and of the physiologist to describe the nature of the organic responses represented in instinctive action, and correlate the structure of organ with the nature of the organic response. But when we come to the matter of studying the nature of the mental impulse and the accompanying emotional states, we are strictly within the realm of psychology. It is patent, then, that the instincts present multiple aspects and according as an observer takes the point of view of a strict psychologist,

¹ *Op. cit.*

a biological psychologist, a psychological biologist, a neurological biologist, or a simon-pure biologist, he is bound to emerge from his survey of the situation with a different statement of the facts and likely with a more grossly different interpretation of them.

Difference in point of view probably explains why instinct has been given such different amounts of space in current textbooks. Some authors adhere to a purely psychological point of view and discuss the topic on the merits of the psychological data alone, while others carry into their psychological chapters of instinct a varying amount of biological or physiological facts and considerations. It would appear a foregone conclusion that an author like Professor Warren, who regards psychology as a branch of general biology,¹ should embody in his treatment of instinct many aspects that a writer like Professor Titchener, who draws a sharper cleavage between these sciences,² would leave to the biologist. The last named writer limits his consideration of the topic essentially to the phenomenological mental contents which issue forth in instinct. If he brings into his discussions any biological considerations, he expressly states³ that he has temporarily stepped outside the bounds of psychology to deal with the biological aspects of instinct, thus offering his apology to the biologist for trespassing. Concerning the common problems which instinct presents to the biologist and to the psychologist he writes,⁴ "The plan and program of a psychology of instinct seem clear enough. The term is common to two distinct sciences, psychology and biology; and the result of this community has been that the psychologists are tempted to write a speculative biology and the biologists to manufacture a psychology of instinct. The mutual recrimination that has ensued is a doubtful gain to science. What we have to do is to leave biology to formulate its own problem, and to accept its solution of that problem, while we ourselves, as psychologists, describe and explain the instinctive con-

¹ 'Human Psychology,' 5.

² 'Textbook of Psychology,' 1 ff; 'A Beginner's Psychology,' 8 ff.

³ 'A Beginner's Psychology,' 207 ff.

⁴ 'Textbook of Psychology,' 465.

sciousness." And elsewhere he says,¹ "If instinct is the general name for the innate nervous tendencies to behavior, then the detailed study of instinct belongs to physiology and general biology. The psychologist is concerned with it only in so far as the innate tendencies guide and form the stream of thought. There is, however, another side to instinct, which makes it a matter of direct psychological observation; the touching off of an instinctive response may be accompanied by mental processes, by sensations and feeling."

Lloyd Morgan² expresses a similar opinion as to the distinctive spheres of biology and psychology in instinct. He says, "If there be reflexes or modes of instinctive behavior which have no correlated consciousness, with them the psychologist has no concern. He may cheerfully hand them over to the biologist." Angell³ also prescribes a rather definite province for the psychologist in the study of instinct when he writes, "Impulse is, then, from the psychologist's standpoint unquestionably the cardinal fact about instincts. The residuum is a matter of physiology and biology. It is a mere matter of neural mechanisms. But so far as we have impulse we have a definite psychical factor, and we must examine it somewhat more intimately." Angell fails to live up to this distinction in his discussion of instinct, however, and carries into his psychological treatment many biological and physiological considerations. But, when strictly and consistently adhered to, the above views account for the fact that a number of authors, who purpose to do full justice to the various topics in psychology, discharge instinct in several paragraphs in connection with their discussions of action, impulse, emotion, reaction, etc.

The behaviorist, it appears, would draw no such sharp line of cleavage between the biology and the psychology of instinct. He would not relegate to the expert biologist those problems of instinct which pertain to the viewpoint of general biology or to that of certain branches of the subject, nor would he commit to a strict and expert psychologist other

¹ 'A Beginner's Psychology,' 207.

² 'Instinct and Experience,' 21.

³ 'Psychology,' 363.

problems of instinct which have a distinctly psychological bearing. He would, it seems, attempt to deal exhaustively with the varied data of instinct from a single point of view. In so far as he lays emphasis upon the nature of the responses made by the organism during an instinctive performance, the behaviorist's viewpoint agrees most closely with that which we have termed the neurological or physiological.

Conclusion.—Three tendencies result from the attempt to deal exhaustively with this intricate topic in current textbooks. In the first place, there is the tendency to confuse the biological and the psychological aspects of instinct, with the outcome that many non-psychological items are brought forward and treated in strictly psychological discussions. Secondly, there is a tendency on the part of some authors to shift, successively or alternately, from one point of view to another so as to cover the multiplicity of facts which instinct presents, and the net outcome of this effort is to carry the author beyond his bounds and prevent him from treating the topic with the thoroughness and perspective of a scientific expert. And thirdly, there is a tendency toward overaccentuating those facts which are observed from the particular point of view of the author in question, with a coördinate tendency toward disregarding, distorting, or even denying other prominent facts which are easily observable from another avenue of approach to the complex situation.

The several branches of the natural sciences study the same bit of subject matter, each from its own narrow viewpoint, but at the conclusion of the study no one of them presumes to have exhausted all the data represented in the complex subject matter. In like manner, the expert biologist, psychologist, or behaviorist has not exhibited all the available facts when he has carried out a complete study of instinct from a single well-defined point of view. Instinct has been dealt with exhaustively when, and only when, it has been thoroughly studied from as many different points of view as it presents distinctive aspects.

SOME DEFECTS IN PSYCHOANALYSIS

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The concepts which it is proposed to criticize in this paper are three which seem to the writer to be in the strictest sense fundamental¹ to the entire psychoanalytic position—the concepts, namely, of the Complex, the Libido, and the Censor (censure, or censorship). My interest is entirely constructive, and my purpose to point out at once the value of these concepts, the weakness of the prevailing definitions of them, and the way in which these defects may be corrected. In the cases of the Complex and the Libido, our chief task will be to defend the larger conception which is even now in vogue in some quarters, against the original narrower one; in the case of the Censor, to suggest a considerable extension of meaning over current usage.

Before undertaking the actual criticism of the individual concepts, let me endeavor to state as briefly as possible the essential principles which seem to be involved in the psychoanalytic theory of the mind, in the form of a series of propositions, keeping especially in view the place of our three concepts in the general scheme. The doctrine asserts: (1) That every mental phenomenon has a mental cause, conscious or subconscious (the principle of psychological determinism). (2) That the unit of mental activity is not the single idea or the sensation,² but the Complex—*i.e.* a group of emotionally toned ideas with a definite conative trend, as will be more fully indicated later. (3) That personality is, ideally if not

¹ Next to that of the Unconscious, which is discussed in my 'Foundations of Psychology,' pp. 220-231.

² See Holt, E. B., 'The Freudian Wish and its Place in Ethics,' p. 47. The author is wrong, however, in supposing that in psychoanalysis the wish *replaces* the sensation as 'the unit of psychology.' Sensation remains a *structural element*: the wish (or rather the entire complex) is the *dynamic unit* (not 'elementary,' however, as the term itself shows).

actually, an integration of systems of complexes, all harmonious with one another in trend; but that actually there is in every personality some degree or other of disharmony and of disintegration.¹ (4) That all abnormal, unhealthy, or unideal behavior is traceable originally to a conflict between complexes or systems of complexes, or between a complex or system of complexes and the remainder of the personality, and has for its aim the relief of the emotional tension inherent in such conflict. (5) That the fundamental conflict, and so the underlying source of all mental disorders until the conflict has been finally solved, is that between the Libido or total conative trend of the subject, and the Censor which seeks to inhibit the expression of that Libido.

If the strict Freudian fails to recognize his theory in my exposition, my defence can only be that I am not interested in vindicating the particular tenets of any psychoanalytic school, even those of the founder of psychoanalysis himself, but in setting forth those principles which seem to me essential to the general psychoanalytic conception of the mind—a conception which was first propounded by Freud, indeed, but which like every other new conception is open to development and correction by later investigators. No changes in the future can possibly take away from Sigmund Freud the credit of discovery and pioneership in this new field.

With this introduction, let us pass to our criticism of the concepts selected for investigation.

I. THE COMPLEX

Two types of definition of the complex—a narrower and a broader one—divide the field between them at the present time. These have in common the teaching that the complex is a system of emotionally toned ideas which tends to express itself through behavior; but whereas the earlier and narrower conception as originally presented by Jung limits the term to those systems which have been *repressed*, and which therefore manifest themselves in *morbid* conduct; the broader view as

¹ See an article by the present writer entitled, 'The Articulation of the Concepts of Normal and Abnormal Psychology,' in *The American Journal of Psychology*, 1914, 25, 283-287.

introduced by Bernard Hart extends the term to include all systems of emotionally toned ideas, whether wholly repressed or partly conscious, and whether manifesting themselves normally or morbidly.

The question at issue will become clearer if we quote and analyze Hart's definition. In quoting it, I shall add a clause which seems to me necessary to complete the essential characterization. A complex, then, 'is a system of connected ideas, with a strong emotional tone, and a tendency to produce actions of a certain definite character'¹—so linked together that the stimulation of one factor arouses the entire complex into activity. This final clause emphasizes the associative nature of the complex (only hinted at by Hart's word, 'connected'), which is certainly an essential feature of it, even in the narrower usage of Jung. Tansley's definition, which belongs to the broader conception, brings out this aspect clearly: "a complex," he says, "is a system of associated mental elements, the stimulation of any one of which tends to call the rest into consciousness through the medium of their common affect."² This definition is defective, however, in its disregard of the dynamic nature of the complex, and gives the term a structural connotation which does not properly belong to it.

Examination of Hart's definition discloses the significant fact that each of the three general phases of mental life—cognition, affection, and conation—is represented in the complex. For the second of these factors a recognized name is already in use; for the others no terms are of universal acceptance, though interesting suggestions have been made which it may be desirable for us to adopt. The three factors, then, are the following.

- I. The 'system of connected ideas,' which constitutes the *cognitive basis* of the complex, and which we shall call the *Constellation*. This term is used by many psychologists, but in widely different senses: the need of a term for the cognitive aspect of the complex, however, seems to justify our suggested usage.

¹ Hart, 'The Psychology of Insanity,' p. 61.

² Tansley, A. G., 'The New Psychology and its Relation to Life,' p. 49.

2. The *emotional tone* of the complex, now quite commonly designated by the simple expression, the *Affect*.
3. For the *conative expression* of the complex I shall adopt the excellent suggestion of F. Lyman Wells,¹ and speak of it simply as the *Trend*. This trend Wells describes as a differentiation or specialized portion of an organism's vital energy—i.e. as the individual complex's share of the libido of the subject. This term is also identical with, and far preferable to, the Freudian 'wish'—which is a 'wish' in no intelligible sense whatever (i.e. is not a conscious desire, which we would like to, but recognize that we cannot at the time, fulfil), but an unconscious tendency or 'trend.'

The issue between the broader and narrower views of the complex has been brought to a head recently in the Symposium before the British Psychological Society at Manchester in 1922,² participated in by Rivers, Tansley, Shand, Pear, Hart, and Myers; and in the other writings of the first-named.³ Rivers and his adherents protest that Hart's extension of the term confuses the complex with the 'sentiment' of ordinary psychology, which naturally arouses the objection of such writers as A. F. Shand and W. McDougall, whose work on the sentiments is universally recognized to be of the first importance. In the Symposium, Mr. Shand, of course, took the narrower position, and in his recent 'Outline of Psychology,'⁴ Mr. McDougall corroborates him.

Let us take the Shand-McDougall definition of a sentiment and see whether it involves any confusion with the Hart-Tansley definition of the complex, or justifies the narrower use of the latter term. To Shand and McDougall, a sentiment is 'an organized system of emotional tendencies centered about some object.'⁵ Rivers suggests that 'sentiment' and 'complex' are species of a common genus: both are systems

¹ 'Mental Adjustments,' p. 29, and *passim*.

² Reported in the *Brit. J. of Psychol.*, 1922, 13, 107-148.

³ W. H. R. Rivers, 'Instinct and the Unconscious'; especially pp. 85-89.

⁴ Pp. 417 ff.

⁵ Definition quoted from McDougall's 'Introduction to Social Psychology,' ninth edition, p. 122.

of tendencies; but a *sentiment* is fully conscious, and normal in its expression, whereas a *complex* is partly 'suppressed,' and tends to produce *morbid* behavior. McDougall, however, in his 'Outline of Psychology,'¹ takes *sentiment* as genus, denoting 'all acquired conative trends,' and restricts *complex* as species, to denote those 'sentiments that are in some manner and degree morbid or pathological.' In this last definition, the sentiment ceases to be primarily an affective affair, and becomes essentially conative—the Trend supplants the Affect as the fundamental factor. But what of the Constellation, which is the central factor in Hart's complex? If the complex is first of all 'a system of ideas' (Hart), and a sentiment a 'system of emotional tendencies' or 'conative trends' (McDougall), there does not seem to be any cause for confusing the two concepts, even if we take the broader view of the complex. The general situation, however, can hardly be considered as simplified by the recent controversy, but rather as even further complicated.

All confusion will be avoided if we accept the complex, defined according to the British school, as genus, and allow for the division of the same into as many species as may be required. Take the term in its broadest, which is at the same time its most literal, sense as referring to *any complex content* of the mind.² All mental contents are complexes of cognitive, affective, and conative factors, and are distinguished most significantly according to which of these factors predominates. The term *Constellation* then becomes particularly appropriate to those complexes which are almost purely *cognitive*—to systems of ideas whose emotional tone and conative trend are weak. *Sentiments* are complexes in which *affection* predominates, as in McDougall's earlier definition—"systems of emotional tendencies centered about some object;" and those complexes which are predominately *conative* are the *Desires*. No reason exists, furthermore, why such complexes, or any of the three varieties of them, should not also be distinguished into conscious and repressed, normal and morbid, etc., without causing any confusion.

¹ *Loc. cit.*

² Surely Rivers is wrong in asserting that the term 'complex' is a misnomer.

The movement to establish the narrower meaning of the term 'complex' is but an example of the unfortunate tendency on the part of the psychopathologists to use terms of general psychological value with a purely morbid connotation.¹ 'Neurosis,' which should mean any specific status of the nervous system, comes to mean a relatively mild² mental disorder; 'psychosis,' which should mean any specific 'state of mind,' comes to mean a severe mental disorder; 'complex,' which should mean any concrete mental content, becomes restricted to morbid repressed contents. The general psychologist should not encourage this narrowing tendency, when the terms are so necessary for his own purposes, and when the use of a few simple adjectives will enable all the needs of the psychiatrist to be satisfied as well.

II. THE LIBIDO

The problem of the nature of the libido has occupied the greater part of the attention of psychoanalysts, and here again we discover the same tendency toward restriction of meaning among the majority, with a minority under the leadership of Jung favoring a broader understanding of the concept in question.

Two extremist schools are especially prominent—that of Freud, which interprets the libido entirely in terms of the sex instinct; and that of Adler, which defines it in terms of the Nietzschean 'will-to-power,' or the instinct of self-assertion. With Freud, we have a very careful antithesis set up between the 'libido' as purely sexual, and the egoistic 'interests' of the individual: with Adler, we have the libido interpreted as egoistic, and sexuality becomes merely one of the instruments of the will-to-power. Boris Sidis, ardent opponent of psychoanalysis though he be, adopts a position closely allied to that of Adler in referring all neuroses to some trauma of fear. Fear, however, is an emotion which arises when the welfare of the self is endangered, and there is the need of defending oneself against such danger. The instinct which fear calls into activity, then, is the instinct of defense, which is the

¹ See my article on normal and abnormal psychology cited above.

² 'Mild,' *i.e.*, as compared to the 'psychosis.'

negative side of the same self-preservative tendency of which assertion is the positive side.

The issue between Freud and Adler-Sidis, therefore, is that between the race-preservative and self-preservative instincts as vehicles of the libido. But the investigation of the neuroses of the late war by MacCurdy,¹ Rivers,² and others, in which it was shown that the nervous disorders of warfare have (as might have been anticipated) an egoistic basis, would seem to refute quite conclusively the restricted Freudian view of the Libido, and to open the way for a reconciliation of the Freud-Adler antithesis.

Some time before the war, however, Jung had proposed a reconciliation of the two extreme views and a broadening of the entire concept of the libido;³ and the neglect of this irenicon by most contemporary psychoanalysts, and the contemptuous rejection of it by some, is a serious disappointment to those who were impressed by Jung's suggestions. William James used to say that psychology (in the closing decade of the last century) was only the hope of a science, and was in the condition of physics before Galileo.⁴ The behaviorists, no doubt, would say the same thing of any mind-psychology at any time, past, present, or future. Psychoanalysts, on the other hand, would incline to greet Freud as the Galileo of the new psychology; and if we are to continue the figure, Jung is its Robert Mayer.⁵

The central contribution of Jung to psychoanalytic theory is his 'energetic conception of the libido.' The real value of the libido theory, he tells us, is to be found in this conception of it, rather than in the narrower sexual definition which Freud

¹ 'War Neuroses,' Cambridge University Press, 1918.

² 'Instinct and the Unconscious,' Cambridge University Press, 1920.

³ 'The Theory of Psychoanalysis,' translation published by the Journal of Nervous and Mental Diseases Publishing Co., 1915. The lectures were delivered in 1912. (See especially Chap. III.) Jung's other writings contain the same suggestion, and his position is favored in a general way by such writers as W. A. White, S. E. Jelliffe, A. G. Tansley, and others. See also L. L. Bernard, 'A Criticism of the Psychoanalysts' Theory of the Libido,' *Monist*, 1923, 32, 240-271.

⁴ See the last pages of his 'Briefes Psychology,' 1892.

⁵ Or Rumford, or Davy, or whom you will: Jung accredits the analogous discovery in physics to Mayer.

defends. In offering this broader definition, Jung is undoubtedly returning to the earlier classical usage of the term, in which it signifies any strong craving or psychical need. His view does not involve, as many of his critics have asserted, any identification of the libido with the metaphysical concept of *élan vital*, or the equivalent pre-scientific notion of 'vital force,' or the contemporary vitalistic 'entelechy.' Like Freud's libido, Jung's complex, or Bleuler's ambivalence, Jung's 'energetic conception' is a scientific hypothesis which stands on the ground of experience and logical inference therefrom. Its true analog, as its author asserts, is the physical concept of energy: libido, according to Jung, is psychical energy, the energy or working power of the psyche, of which all actual psychical activity is a manifestation.

By means of this conception, the plurality of instincts—universally accepted until recently, by all psychologists—is reduced to unity, and all instincts are regarded as differentiations, or manifestations in different forms, of the one primitive libido. The principle of conservation of energy also becomes applicable in the mental field; every individual being conceived as endowed with a specific quantity of libido, which remains constant through life, its various manifestations being merely transformations of this libido or transferences of it from one field to another; and any apparent increase or decrease being accounted for as a passage of libido from the unconscious to the conscious or *vice versa*.

Especially in these present days, when the concept of instinct in its orthodox pluralistic form (and therefore, by implication, in all its forms) is being attacked from every side, and even the very existence of instincts is being questioned, it would seem that the conservative-progressive psychologists would find in Jung's theory the very solvent which their science most needs. The truth back of the current attack on instincts seems to be the same as that which united a previous generation of psychologists in arms against the then current faculty theory of the mind. It is not the will that wills, they said, but the mind; not the imagination that imagines, but the mind. So today we find men insisting, and

quite as properly, that it is not the sex instinct which lies behind some forms of behavior and the self-preservative instinct behind others; but rather that it is the whole individual which behaves in this or that fashion. As 'will' is merely a name for the whole mind as active, so 'sex instinct' is merely a name for a certain aspect of the individual's total conative tendencies. The psychoanalyst, then, might contentedly agree to join hands with the behaviorist in throwing instincts overboard, if the latter would but leave to the former his energetic libido.

From the standpoint of English scientific terminology, a suggestion may not be amiss at this point. Generally it has been found desirable, when a new concept has appeared on the horizon of scientific thought, either to redefine some word already in good usage, or to fabricate an entirely new term of classical (usually Greek) etymology, rather than to adopt directly into English a word from a foreign language. This is, I think, an excellent custom; and such a word as 'libido,' with its questionable signification, carried over bodily from the Latin, is a particularly imposing example of what should be avoided in nomenclature. As there is certainly no good English equivalent in current usage,¹ it would seem necessary to invent a new one. I propose, therefore, the term *Psychergy*, which would seem to have the double advantage of preserving the physical analogy which Jung has pressed, and of leaving the Freudians free to employ the term 'libido' in the sexual sense if they so prefer, thus avoiding the present confusion between the restricted and the extended senses of the term.

In closing this part of our subject, we may formulate the relation between the concept which we are now considering and that which just previously occupied our attention in the proposition (following Wells ²) that the Trend of the individual Complex is in every case a specialized portion of the total Psychergy of the subject.

¹ Wilfrid Lay suggests 'craving' ('Man's Unconscious Conflict,' and other works), but this hardly seems to have quite the needed significance, or sufficient dignity for scientific utilization. And the term 'urge,' favored in some quarters, has numerous objections.

² *Loc. cit.*

III. THE CENSOR

The most serious defect in current psychoanalytic theory is the lack of any well-considered doctrine of the so-called 'Endopsychic Censor.' The interest of the various psychoanalytic schools has been so engaged in controversies over the nature of the libido, that they have usually been contented merely to give a name to the repressing force which prevents the expression of the libido, without inquiring deeply into its nature. This element of the conflict, however, is fully as important as the other, and demands investigation and definition.

The first important step toward such a doctrine of the censor has been taken by W. Trotter in his theory of the 'herd instinct.'¹ The tendency of this instinct is to conform the beliefs, feelings, and behavior of the individual to those of the community in which he lives; and thus to inhibit any inclination on the part of the individual to express himself in ways which are at variance with the customs of the community. The expression 'herd instinct' is given to this tendency in order to emphasize as forcibly as possible the similarity between the action of over-individual forces in man and in the so-called gregarious animals. In the lower animals, however, the relation between individuals is a solely physical one: in man it is primarily a mental relationship. To bring out this distinction, which seems to me far more significant for the psychologist than the afore-mentioned similarities, I propose to term this tendency henceforth the 'community instinct.'

The fundamental conflict, then, according to Trotter's theory, is that between the impulses of self-expression (hunger, sex, etc.) on the one hand, and the restraints and inhibitions of society on the other. This conflict, he says, must be entirely endopsychic, both its elements being in the mind—not merely between the desires of the individual and forces acting upon him from outside. "In order that a desire may set up conflict, it must be thwarted, not by a plain impossibility or by a mere physical pain, but by another impulse within the

¹ In 'The Instincts of the Herd in Peace and War,' 1915; embodying essays first published in 1908 and 1909. See especially pp. 79-83.

mind antagonizing it." But this antagonizing impulse is that innate 'sensitiveness to external opinion' which makes us more comfortable and happy so far as we are able to conform our conduct and beliefs to those of the community: "the essential specific characteristics of the mind of the gregarious animal is this very capacity to confer upon herd opinion the psychical energy of instinct."

The outcome of Trotter's theory is to identify the Freudian 'censor' with the community instinct. This identification I am ready to accept so far as it goes. But I wish to point out two ways in which the very notion of the censor itself and the usual view of the community instinct seem to me defective, and to indicate the directions in which these concepts may be so extended as to correct their present deficiencies.

In the first place, the concept—yes, the very name—of the censor is purely *negative*. A censor is literally one who prevents certain acts from being performed, or certain goods from 'passing through,' which but for him would be performed or pass through. In this meaning, the term is figuratively applicable in the mental sphere so long as the narrow Freudian theory is adhered to. But *social forces are not solely repressive and inhibitive*, even though that be their main influence: they may also become *stimulating and constructive* forces in life—forces of *sublimation* as well as of repression, forces through which the libido may express itself to the best advantage of the individual. Some other term, therefore, must be substituted for 'censorship,' if this positive function of the 'community instinct' is to receive the necessary recognition. This instinct is a *director* of psychergy, rather than merely a censor. If we are to follow the anthropic analogy—and I see no reason why we should not—some such term as 'director' or 'controller,' which will allow for the positive as well as the negative aspect of the over-individual influence, is far preferable to 'censor.'

A second desideratum finds incidental intimation in a sentence from one of the books of W. H. B. Stoddart.¹ "In practical experience," he says, "we find that by far the greater

¹ 'The New Psychiatry,' 1915, p. 9.

[sic] majority of conflicts occur between a personal complex and a herd complex—that is to say, between morality, religion, . . . or fashion on the one hand, and nutrition, self-preservation, or sex on the other.” In other words, three grades or levels of over-individual influence must be distinguished. The lowest of these is the level of what we variously call convention, fashion, social custom, propriety, the force of public opinion, etc.¹—the equivalent of animal ‘herd instinct’; the second and higher level is that of *morality* (conscience, the moral law, the sense of duty); and the highest level is that of *religion* (faith, prayer, etc.). If we are to use Trotter’s term, we shall find that it applies solely within the lowest level, and it will be necessary for us to regard it as inadequate: if, however, we accept the term ‘community instinct,’ we shall be justified in thinking of these levels as grades of that instinct, since morality and religion as well as convention are social phenomena.

Apart from what seems to be its truth, the recognition of these three levels of the community instinct has a further advantage in confirming the positive significance of this instinct on which we have just dwelt. *Convention*, doubtless, is mainly a repressive force, preventing us from doing what we should like to do far more often than it urges us to do things that we otherwise would not do. A man must not go about in public in his shirt-sleeves because it is not ‘proper,’ or wear a straw hat on a warm day in late September because it is not ‘the fashion.’ But as we ascend the ladder of endopsychic control we find the negative side becoming less and less prominent and the positive coming more and more to the fore. *Morality* is no doubt largely restrictive, but certainly not wholly so: the inadequacy of a solely ‘negative morality’ is universally recognized by ethical writers today. And when we come to *religion* we find a distinctly positive phenomenon, which is far more expansive and stimulating in its influence than it is restrictive. To take its most characteristic methods of expression—prayer and church-going: certainly it is not in these days (however it may have been in the past) fashion-

¹ Law is merely convention enforced by the state.

able to say one's prayers or to go to church, nor do these activities satisfy in any literal sense the egoistic or sexual interests of the individual, or aid in the preservation and organic evolution of the race.

Religion claims to bring the individual into contact with a wider environment than the merely physical one with which the 'self-preservative' and 'race-preservative' instincts have to do, or the purely human one which expresses itself on the levels of convention and morality. The religious or spiritual environment is a cosmic, a hyper-physical and super-human, environment; and in the exercises of religion the religious man seems to experience a strengthening of his inner psychical energies ('psychergy' or 'libido') by the absorption of a portion of that *cosmic energy* which radiates from the Source of all life. Whatever one's opinions may be about the *reality* of the supreme Object of religion, this feeling of assistance from without is at least one of the characteristic elements of religious *experience*. If we interpret this experience objectively at all, even in a non-religious sense, we have apparently two fields of psychergy—that within each individual mind, and that which permeates the universe without; and in the final analysis these may prove to be in their essential nature one. James, long before the days of psychoanalysis, offered a similar suggestion in his teaching that religious experience brings us into contact with some power beyond ourselves—a 'More,' which, whatever it may be in itself, is 'on its hither side the subconscious continuation of our conscious life.'¹ But I do not wish to enter further into metaphysical and theological questions in this place.

IV. SYNTHESIS AND CONCLUSION

It may be helpful in bringing our criticisms and suggestions to a close to set forth in a single table the underlying thoughts which have directed the argument. I present, therefore, a classification of the dominating human instincts in their relation not only to one another, but also to the teachings of the various psychoanalytic and allied schools, and to my own suggestions.

¹ 'The Varieties of Religious Experience.' The quotation is from page 512.

ENDOPSYCHIC FORCES	
FORMS OF PSYCHERGY	I. <i>Self-Instincts</i>
	1. Hunger (Jung, in part)
	2. Defensiveness (Sidis)
	3. Assertiveness (Adler)
	II. <i>Race-Instincts</i>
	1. Sex (Freud; Jung, in part)
	2. Parental Instinct
	3. Filial Instinct
	III. <i>Community Instinct</i> : Gregariousness
LEVELS OF CONTROL	1. Convention
	2. Morality
	3. Religion

The 'instincts,' we have insisted, are not separate, more or less mysterious, innate forces which control behavior independently of experience; but rather names for certain groups of specific tendencies, or particularized forms of the general psychical energy of the individual. Nor is the grouping a teleological one, and so criticizable as unscientific; since we may define, for example, the 'self-preserved instincts' as those whose fulfilment tends to preserve the life or further in one way or another the welfare of the individual—not as those whose *end* is the preservation of the individual.

Under the first head, then, come (1) the instinct to seek and consume food; (2) the instinct to defend oneself against anything that is regarded as menacing one's welfare in any sense; and (3) the instinct to assert or express oneself in the world. All these tendencies are certainly characteristic of the human species. If we apply even such a generous conception of instinct as that of McDougall, every one of his list¹ will find a place in our scheme: the instincts to escape from danger, to shrink from that which disgusts, to abase oneself in the presence of that which is recognized to be superior, are all special forms of self-defense; the instincts to approach that which attracts us and to fight those who insult us, to acquire property and to construct things, are all

¹ 'Social Psychology,' Chap. III. 'Outline of Psychology,' Chap. V.

S.B.

special forms of self-assertion. Of these, Jung recognizes hunger as one of the two most important phases of psychergy; Adler traces all neuroses to the desire to compensate for defects by an exaggerated activity, and so makes the 'will-to-power' or instinct of self-assertion fundamental; and Sidis finds fear at the basis of all neuroses, fear being the most typical emotion connected with the instinct of self-defense.

The second group of instincts is represented in the human species by the institution which we call the family. Much of the criticism hurled against Freud's special theories might be averted if his term 'sex' could be interpreted as meaning not merely the instinct which brings male and female together, but also that which binds parent and child—that the relation between parent and child is not in any proper sense a 'sexual' relationship, but a relationship as vital to the human race as that of sex. The 'Oedipus-complex' becomes, then, a more or less morbid confusion of the filial with the properly sexual one. As to our justification for including this 'filial instinct' in our list, I can only say that whatever may be true of the lower animals, human evolution has so brought it about that the recognition of an interdependence between father, mother, and child is now an essential trait of the normal human family: the direction of the child's psychergy toward the parent, therefore, is quite as important as the direction of the parent's psychergy toward the child.

The community instinct we were discussing in our previous section in its control function as censor and director of psychergy. In its simplest form as gregariousness, however,—the instinct to *live* in a community, to avoid being alone—it is rather one of the ways in which psychergy naturally expresses itself. For this reason, I include gregariousness among the 'forms of psychergy,' but group also the three grades of community influence above distinguished as 'levels of control'; all together constituting the fundamental 'endopsychic forces' which govern and express themselves in human behavior.